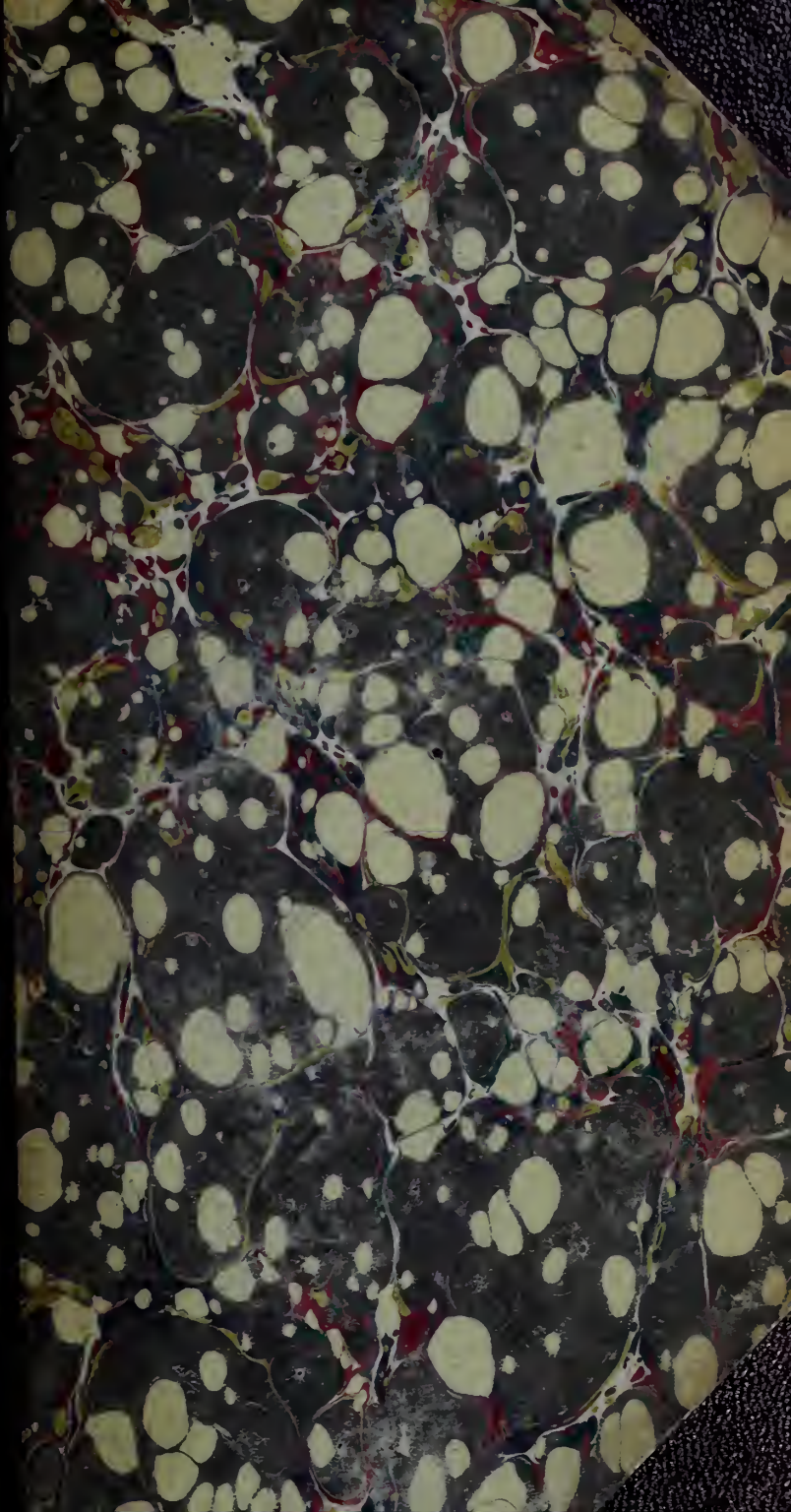

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OF

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EDITED BY

JAMES PRINSEP, F. R. S.

SECRETARY OF THE AS. SOC., AND HON. MEM. OF THE AS. SOC. OF PARIS.

VOL. III.

JANUARY TO DECEMBER,

1834.

"It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta; it will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely cease."

SIR WM. JONES.

Calcutta:

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1834.

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 34.—*October*, 1834.

I.—*Notice of some Ancient Inscriptions in the Characters of the Allahabad Column. By* B. H. Hodgson, *Esq. Resident in Nepal.*

[In a Letter to the Secretary, read at the Meeting of the 28th May, 1834.]

With reference to the remarks in No. 27 of the Journal on the Allahabad Column, and, more particularly, to the note at the foot of page 116, I hasten to inform you, that some 8 or 10 years ago, I sent to the Asiatic Society drawings and descriptions of a column, and inscription, which I found in the Taraï of zillah Sárun, half way between the town of Bettiah and the river Gandac, west and a little north of Bettiah, and very near to the Nepal frontier. There is a similar pillar, and similarly inscribed, close to the high road from Segonly to Patna; and though this be, I suspect, in zillah Tirhút, not Sáran, and though Stirling call his Láth, the *Sáran* pillar, yet I believe him to allude to the latter monument, and not to mine: because the latter is situated in a frequented country, and commonly traversed route to and from sundry familiar places; and if not in Sáran, it is, at least, close to its boundary; whereas the former stands in a desert out of the way of all ordinary routes. At all events, whether Stirling alluded to one or the other monument, it is certain, that there are *two* in north Behár; that both bear inscriptions of an identical character with your No. 1; and that both columns resemble in size and shape the Allahabad one, and that of Firoz Shah. I possess likewise an inscription, procured from the Ságar territories, written in the very same character. When therefore we consider the wide diffusion over all parts of India of these alphabetical signs, we can scarcely doubt their derivation from Deva Nágarí, and the inference is equally worthy of attention that the

language is Sanscrit. I use the words Deva Nágarí and Sanscrit in the largest sense, and mean thereby, the language and literal symbols of the learned Hindus; for, you know, it is a questiou whether the existing Deva Nágarí and Sanscrit be the primitive types, or, only the last results of refinement of older forms. The learned among the Hindus, so far as I know, adhere to the former opinion, and insist that all the Bháshas and their written characters, are derivatives from the primitive and perfect types, viz. Sanscrit and Deva Nágarí. And, with reference to the variety of alphabetical signs, which are daily being discovered by us, the common assertion of the Pandits of both the Brahmanical and Bauddha faiths is particularly worthy of observation. They say that there are, or were, no less than 64 Bháshas, each with its appropriate alphabet, derived from Sanscrit. Now, though the round number, 64, should probably be received with a grain of reserve, yet the many new varieties (so to speak) of Deva Nágarí, which we have discovered in the last 10 years, obviously drawn from that type, tend to confirm the general truth of what the Pandits assert; and, at the same time, warrant the expectation that we shall find many more yet, as well as countenance such presumptions as that your Nos. 1 and 2 are essentially the *same*, and that both are essentially *Indian*, or (in the language of the Pandits, varieties of the Deva Nágarí type.

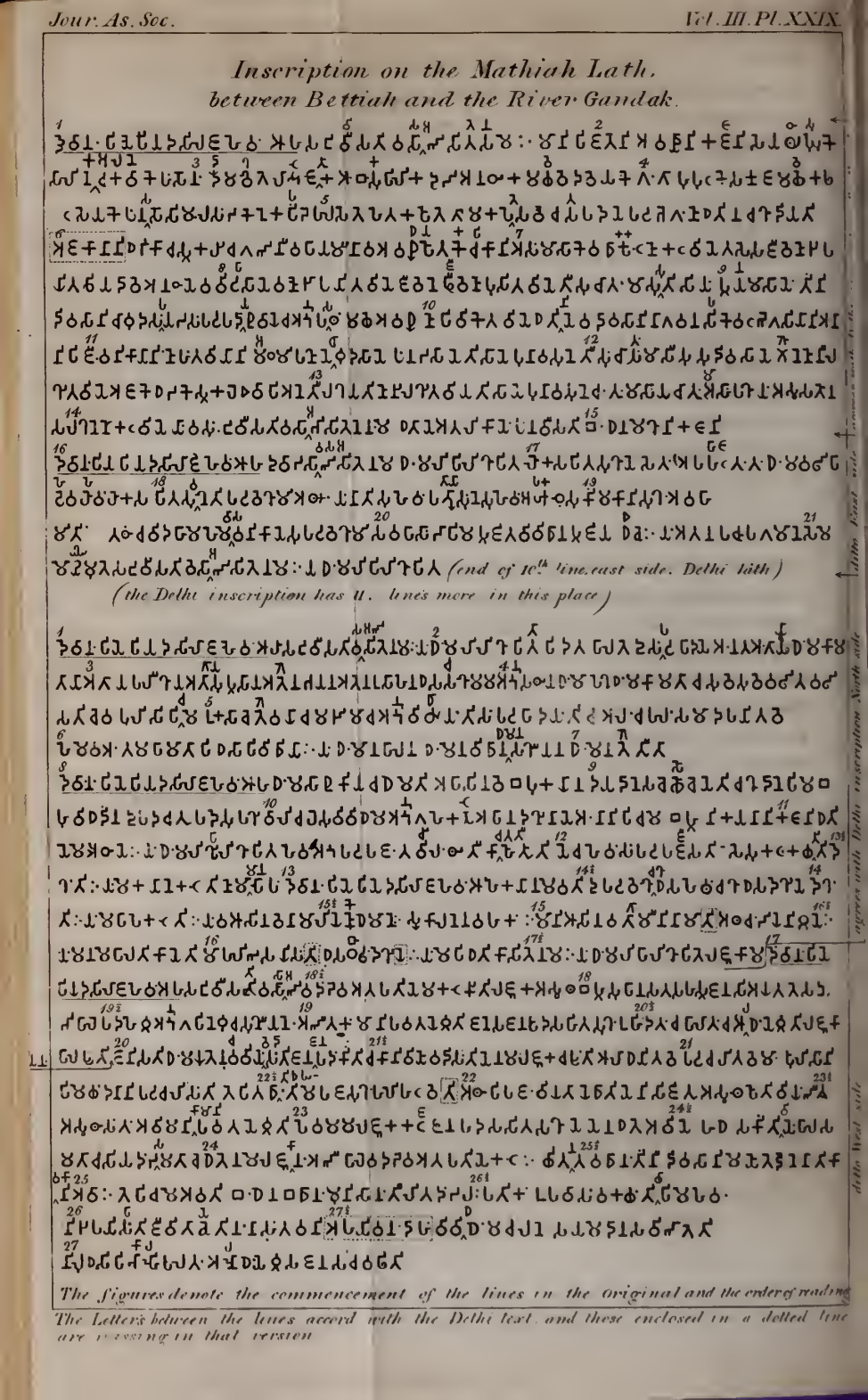
When I forwarded the drawing of the *Mathiah* pillar, (for so it is called by the neighbouring peasants,) with copy of the inscription upon it, to Dr. Wilson, I noticed the resemblance of the letters to those of Tibet, as well as that of the couchant lion* on the top of the monument to the effigies of the same animal, forming the most common sculptural ornament of a certain class of temples in Nepal. And I observed to Dr. Wilson, that those circumstances had led me to hope that some Nepalese Pandit of the Bauddha faith would have been found capable of expounding the inscription :—an expectation in which, I added, I had been disappointed. If you examine the records of your museum, you will, I hope, find the Mathiah pillar and inscription; but, if not, and I still retain (of which I am doubtful) copies of them, I will forward them to you; and also, if you desire it, the Ságar inscription.

Kathmandú, 24th April, 1834.

I have just ascertained from Lokráman Upadhya, the Nipalese Vakíl, that there are *three* Láths in North Behár, inscribed with the

* Lieut. Burt's *Bull*, which crowned the Prayág Láth, is or rather was, I suspect from analogy, a *Lion*.

Inscription on the Mathiah Lath,
between Bettiah and the River Gandak.



character No. 1, and, moreover, a Déhgôp, or hemispherical Bauddha mausoleum and temple, in the same region.

The first of the Láths is the well known one near Bakra, in sight of the high road to Hajipúr, and this is surmounted by a lion. The second is at Radiah, near Arahráj-Maha Deva, district of Majhouah, and zemíndary of Bettiah, and it has *no* lion.

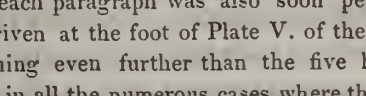
The third is the Mathiah one, between the town of Bettiah and the Gandac, eight or ten miles (perhaps more) west, and a little north, of Bettiah town. It has a lion. I find that my copy of the Mathiah inscription is gone home; you shall have a new one made, if you need it. And I have ordered drawings and inscriptions to be taken from the other two pillars.

I have likewise directed a drawing to he made of the Kesriah mound, which is undoubtedly a Bauddha Déhgôp or Chaitya, and such also is the Mánikayála tope. There are *scores* of them in this valley.

II.—*Note on the Mathiah Láth Inscription. By* Jas. Prinsep, *Sec. &c.*

Since writing the above, Mr. Hodgson has favoured me with a native drawing of the column near Bettiah, which is engraved as figure 2 of Plate XXVII.; and a copy of the inscription it bears is given at length in Plate XXIX. The accuracy of the copy from the MS. has been verified by careful examination, but the native engraver, to save space, has unfortunately carried on the whole text continuously, so that it does not shew the commencement of each line according to the original. This defect I have endeavoured to remedy by placing small figures to mark the beginning of the lines, as it was hardly worth while to re-engrave the whole plate.

The character of this inscription was at once of course recognized to be the same as that of the Allahabad column and Feroz's Láth. The initial word of each paragraph was also soon perceived to agree with the specimen given at the foot of Plate V. of the present volume—the identity continuing even further than the five letters there marked, and extending, in all the numerous cases where the form occurs, to the following fifteen letters—



The trifling variations which may be perceived in one or two of the readings of this sentence, which may be supposed to be some formula of invocation, are evidently attributable to errors of transcription.

Upon carefully comparing the Bettiah inscription with those of

Allahabad and Delhí, with a view to find any other words which might be common either to two or to all three of them, I was led to a most important discovery; namely, that *all three inscriptions are identically the same.* Thus, the *whole* of the Bettiah inscription is contained verbatim in that of Feroz's Láth, published in four consecutive plates, in the seventh volume of the Asiatic Researches: and all that remains of the Allahabad inscription can with equal facility be traced in the same plates, with exception of the five short lines at the bottom, which appear to bear a local import. The last eleven lines of the *east* inscription of the obelisk of Delhí have indeed no counterpart in the other two; but this may be also owing to the destruction of the corresponding lines of these two texts, which happen to be, on them, the final and nethermost portion of the sculpture.

To enable the reader to judge of the agreement of the three inscriptions, I have added to Plate XXIX., since it has been engraved, marginal references, to point out the corresponding sheets of the Delhí inscription. I have also marked all the variations, omissions, and redundances that occurred on a careful comparison of the two texts, omitting only the mere errors of vowel marks, the correction of which would have confused the already painful closeness of the writing. Considering that the Bettiah inscription was taken down by a native artist, the errors of copying do not appear to be very numerous. There are more considerable discrepancies found on collating the Allahabad transcript of Lieut. Burt, with the original from Delhí, owing no doubt to its dilapidated condition. It is a fortunate circumstance that the Delhí sculpture remained in so perfect a state of preservation, when it was first discovered and examined by the English. It seems moreover to have been most carefully taken down by Captain Hoare.

On referring to my former note on the Allahabad column it will be remarked, that most of the anomalous letters, which I had thrown out of the classification of this alphabet in Plate V., are, on comparison with the other texts, now reduced into simple and known forms. A few other remarks that occurred on passing my eye carefully over the whole three inscriptions, may perhaps help in determining the value of some of the letters.

1. I asserted on that occasion that there appeared to be no compound letters:—several very palpable instances however occur in the Bettiah inscription, of double letters substituted for two single ones in the Delhí column. These are as follows:

In the fourth line of the Bettiah version ꣡ is found to be substituted for DJ of the Delhí text. In the first line the same substitution

is made, with the addition of one of the vowel marks, for . In the eleventh line occurs for : in the thirteenth, for : in the 28th, we find taking the place of : and the same contracted form occurs also in the Allahabad version (vide scheme of Alphabet, Plate V.) The commonest double letter however in both these two texts is , which corresponds with of the original or Delhí column.

Other contractions of less certainty may be remarked in the body of the inscriptions : for instance, for ; for ; for . It is probable also that and , are contractions of and , though this is not borne out, like the others, by actual example of the separated letters.

2. From the frequent and almost exclusive occurrence of as the secondary consonant in the above enumeration of double letters, as well as from its resemblance in form to the corresponding letter of the Gya alphabet (No. 2, see Plate VI.), I think a strong probability is established that this letter is equivalent to *y* or य of the Deva Nágarí alphabet.

The other subjoined letter has a great analogy to the Sanscrit व. The letter, with which these two are most frequently united, may with equal probability, be set down as equivalent to the Deva Nágarí *s*, स; whence the compounds may be pronounced to be स्य and स्व, the two perhaps of most common occurrence in the Sanscrit language.

3. The letters and are found to be frequently interchangeable in the inscriptions; corresponding in this respect to the व and ब of the Nágarí alphabet, and strengthening the assumption just made. and are also very commonly confounded, and it is most probable that they are the same letter. The triangle (No. 28 of the alphabet in Plate V.) of the Delhí inscription, is invariably represented by the half-moon letter D (No. 13) in the Bettiah Láth, and therefore the former may be erased from the alphabet: the anomaly of the same character, shaped like the letter V, proves on comparison to be the same letter as the foregoing.

4. The letter (No. 14 of the alphabet) is very commonly omitted in the Láth of Bettiah, especially when it occurs before No. 24. This character also is subject to no vowel inflections; its variations of form though numerous prove to be merely accidental.

5. In the Delhí text as printed in the Asiatic Researches the words are separated from each other, according to the European fashion. This circumstance is of great consequence, (especially as it is not observable in the other two transcripts,) because it enables us to form

some notion of the terminations and inflections of the words. Thus where we perceive an instance, (and many such occur,) of five or six consecutive words ending in the same letters, we may fairly presume them to be connected in case and gender, like the long compound epithet of the second inscription described by Dr. Mill, (p. 260.)

6. The characters most often forming the termination of words in the Delhí text, are [illegible] and [illegible], of both of which upwards of 40 instances occur. Next to them in frequency, come [illegible], [illegible], and [illegible], about 20 of each: then [illegible] and [illegible], [illegible] and [illegible], about a dozen each: the other letters are comparatively rare as finals. It may be remarked, that the vowel inflection, which has been set down as *é*, is affixed to most of the final consonants, affording another argument in favor of the language being Sanscrit.

7. The order in which the inscription should be read is wrongly given in Captain Hoare's plates, where he makes the east portion follow that of the north. That the north is the proper commencement is proved by its being the uppermost of the Allahabad column; then follow the west, the south, and the east respectively.

For convenience of reference, I may here remark, that the first eight lines of the Allahabad Láth inscription include to the third letter 19th line, Plate X., Asiatic Researches, vol. vii. They are here cut off by the Persian inscription. The following half line, partially clipped on the upper surface of the letters, begins with the eleventh letter of the fourteenth line, Plate XIII. of Delhí. The next three lines finish the same plate; but three letters are missing from the beginning of each line (owing probably to the peeling of the stone).

The three following lines (13, 14, 15,) correspond with the commencement of Plate XII., and also with the uppermost part of the Bettiah inscription in the present plate; the three or four initial letters of each line are here also cut off by some accident.

Line 20 of Allahabad begins with the sixth letter of Plate XI. of Delhí, and the detached portions of the neighbouring lines may easily be found in their respective places.

In the second half of the Bettiah inscription (which should come first in the order of reading), one circumstance tends very much to perplex the comparison with that of Delhí, which is, that from the last letter of the 20th line onwards, the native copyist (at least I imagine the fault must be his) has transposed every half line of the text, placing *first* what by the Delhí column should be the *last* half of each line. This defect I have attempted to correct by placing intermediate figures over the first letter of each transposed passage: thus, the

order of the figures being now in the engraving 12, 13½, 13, 14½, 14, &c., the order in which the text should be read to make it agree with the Delhí text is, 12, 13, 13½, 14, 14½, and so on in the natural progression of the figures.

These circumstances prove how very important has been the discovery of the identity of the three inscriptions; for when to the numerous errors of copying, is superadded the perplexing transposition in a complicated manner of one half of the inscription now before us, we may readily imagine the almost insuperable difficulties it would have presented to a translator, even had he a perfect acquaintance with the alphabet and language! The case is now very much altered, and those who have the desire to signalize their learning and ingenuity by decyphering the purport of the document, may go to work with perfect confidence, that by collation of the three manuscripts, he can provide himself with a faithful copy of the original type. Whoever also undertakes to make a facsimile of the other inscriptions stated by Mr. Hodgson to exist in Behár and Nepal, should have a copy of the corrected version before him, that he may note the variations as he proceeds.

Of the origin and nature of these singular columns erected at places so distant from each other as Delhí, Allahabad, Bettiah and Patna, all bearing precisely the same inscription (as far as the unknown character is concerned), I will not venture to offer any speculations. Whether they mark the conquests of some victorious rájá;—whether they are as it were the boundary pillars of his dominions;—or whether they are of a religious nature, bearing some important text from the sacred volumes of the Bauddhists or Brahmins, can only be satisfactorily solved by the discovery of the language, and consequently the import these curious monuments are intended to convey. The new facts now brought to light, will I hope tend to facilitate this object, especially the discovery of the double letters which, added to the mode of forming the vowels, leaves little doubt that the alphabet is a modification of Deva Nágarí, and the language Sanscrit*, as suggested by Mr. Hodgson.

* After sending the above to the press, I was favored with an interesting communication from the Rev. Mr. Stevenson, a distinguished Orientalist, well known as the author of the Maharastra Grammar, on the Ancient Inscriptions in the Caves of Carli, which is inserted as Art. IV. of the present number. Although I am not prepared to confirm in toto the scheme of Mr. Stevenson's alphabet, since when applied to the Allahabad inscription, it does not convert the context into intelligible Sanscrit,—it is most satisfactory to find that many of his equivalents for the ancient letters are the same as those to which the discovery of the double letters above described has led myself; affording thus, a stronger argument in favor of their being correctly interpreted. Of these it is only necessary to mention the *s* and the *y*, of which we may now be quite certain. One more effort by a competent Pandit, with the aid of Mr. Stevenson's labours, will

III.—*Second Note on the Bhilsá Inscription. By the same.*

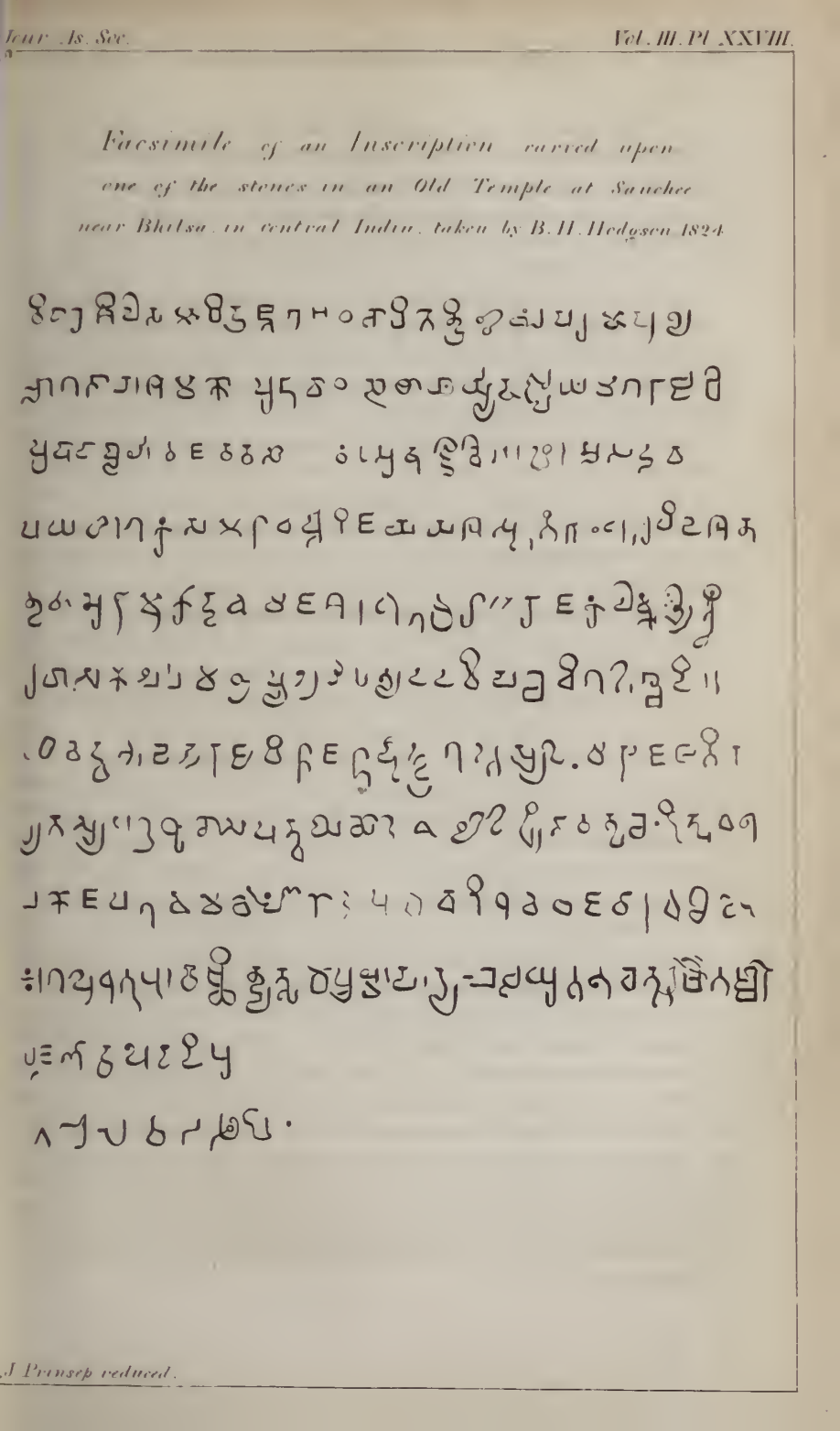
An original facsimile of the inscription in the neighbourhood of Bhilsá, to which the foregoing note of Mr. Hodgson also alludes, was fortunately in his own keeping, and was transmitted to me for the purpose of having an accurate copy transferred to copper-plate. This has been done in Plate XXVIII. with the greatest care and fidelity, but still with little success as to useful result, further than the certainty now acquired that its character is the same as that of the Allahabad column No. 2, which from the circumstance of its occurrence on all the gold Kanouj coins, we may properly distinguish by the title of "Kanouj Nágarí." There is however a considerable admixture of the more ancient character, so much so that the period of its sculpture might seem to form an intervening link in the history of the two alphabets.

None of our orientalists have yet been able to make any thing of the Bhilsá or Sánchí inscription, although they are far from abandoning their attempts to decypher it. I am perhaps to blame in exhibiting it prematurely to the world before it has been read, but I justify myself in the reflection, that the more it becomes known the better chance have we of a solution of the enigma. We may find duplicate and triplicate versions of part or the whole in other places, as in the remarkable example just brought to notice, and may thus correct dubious forms and render effaced ones legible. As the present inscription was a facsimile taken by compressing the paper on the surface of the stone, there can be no doubt of its exhibiting every impression precisely as it exists there; but every slight chip or flaw is also made manifest, and in a few cases the true letters may thus be rendered imperfect. On the whole, however, it appears very authentic, and only difficult to read from the rude execution of the stone-cutter's chisel.

This inscription, it is known, belongs to a Bauddha edifice. A few months since Dr. Spilsbury sent us a native drawing of the sculpture on one of the compartments of the same monument, which puts the matter beyond doubt; for it represents the consecration of the *chaitya* or dehgope by a procession of nobles, priests, and votaries. This curious drawing is engraved in Fig. 1, Plate XXVII. It is much to be wished that some amateur artist would pay a visit to the spot, and bring away accurate drawings of the whole details of this highly interesting object

doubtless unravel the whole mystery of the pillar inscription. It might, perhaps, be deemed by some more prudent to make this attempt before publishing the present notice; but, it is precisely because I have not the necessary acquaintance with Sanserit myself, that I desire to make known generally the progress and results of fortuitous discoveries, which may be of service to others in their investigation of the inscription. J. P.

Facsimile of an Inscription carved upon one of the stones in an Old Temple at Sanchee near Bhilsa, in central India, taken by B. H. Hodgson 1824



J. Prinsep reduced.

of antiquity. One addition to its elucidation chance has enabled me to contribute.

The late Mr. S. V. STACY picked up at auction some original sketches of architectural monuments in central India, signed "ROEBUCK, 1819." Most of them are without any memorandum to explain to what monuments they belong: but one of them fortunately bears the title "Plan of the Jain or Buddhaic Building at Sanchee Kanikhéra, on the west bank of the Betwa near Bhilsá, called '*Sas buhoo ka Bittha.*'" From the hand writing I should judge that the sketch must have been prepared by the late Dr. YELD, apparently for the guidance of some person about to visit the spot, probably Captain FELL. I have introduced the plan and elevation in Plate XXXI. as an appropriate accompaniment to the preceding plates. Some of the marginal notes are worthy of being transcribed:

"In visiting this place, remember also to inquire for some buildings at a place called *Jhinneah ka puhar*, three miles to the north-west of Oodygiri." "There is also an unfinished figure of a horse and a recumbent figure on an adjacent hill in the direction marked M." "The arrow H points in the direction of Oodygiri, where there is a rock with some curious sculpture, and apparently the quarry whence the stone of the present building was derived."

"K points to a temple containing an image of *Buddha*.

L, to another of a similar nature, 200 yards off.

N, to a smaller temple.

A is the site of a pedestal imbedded in a square basement: near which lie the broken parts of a large image.

B, B, and B are three images of *Buddha* within the enclosure.

C is a standing figure, with a smaller figure having curly hair, on his left hand: resting on an elephant on the right.

D is a large broken pillar, the sum of the pieces exclusive of the capital, forming originally a single stone, measure 31 feet 10 inches."

Whether or not this sketch was prepared for Captain E. FELL, it agrees precisely with the description published by him in the Calcutta Jonrnal of 11th July, 1819. This account has not appeared in any work of a more permanent nature, nor is it alluded to by Mr. ERSKINE in his Dissertation on the Bauddha monuments of India, in the Bombay Transactions. I shall therefore make no apology for reprinting it from BUCKINGHAM's Journal, and if hereafter I am favored with any further drawings of the antiquities in its neighbourhood, they shall be added to the present plates. Captain FELL talks of 'numerous inscriptions,' especially one which gives the date of the erection, in *Samvat* 18, or 40 B.C.

This point requires to be confirmed by a facsimile of the document before it can be credited. If it were possible to perforate the structure without injury, some coins might probably be found deposited in the interior which would better serve to determine its antiquity.

Description of an ancient and remarkable Monument, near Bhilsá.

On the table-land of a detached hill, distant from Bhilsá four miles and a half, in a south-westerly direction, is an ancient fabric, of a hemispherical form, built of thin layers of free-stone, in the nature of steps, without any cement, and to all appearance solid ; the outside of which has been faced throughout with a coat of chunam mortar, four inches thick ; most of this still remains in perfect preservation, but in one or two places a small portion has been washed away by the rain.

The monument (for such I shall term it) is strengthened by a buttress of stone masonry, 12 feet high and 7 broad, all around the base, the measured circumference of which is 554 feet. The diameter of the superior surface is 35 feet, the ascent to which is easy by the assistance of the projections of the different layers. Originally it was crowned with a cupola, supported by pillars ; but the cupola is now split, and lies, as well as the pillars, on the top. A line drawn from any given point of the base to the centre of the crown measures 112 feet.

The weight, together with the age and extent of the structure, has forced a portion of the buttress to jut out and give way, by which I had a fair opportunity of fully determining that no cement has been used in the interior of it.

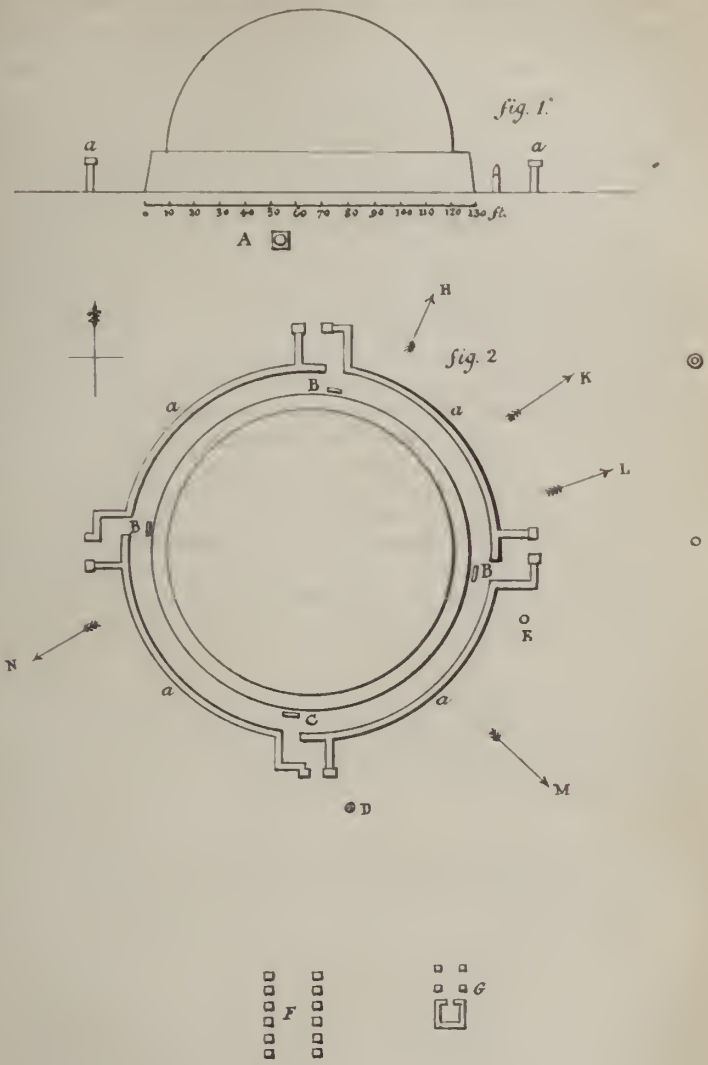
From the different buildings near it having fallen into decay, whilst this stands entire, together with its immense extent, which would rather aid dilapidation than otherwise, I am induced strongly to suspect (enforced by the general impression the structure made upon me whilst examining it, and an aperture appearing in every representation of the monument, sculptured in the different compartments of the gate-ways, and even on detached stones), that it is supported by internal pillars. If so, apartments undoubtedly exist within, highly interesting, and worthy of being further examined. Indeed when you view so large a mass of stone, placed in such neat order, without any cement in the interstices, it must forcibly strike the most superficial observer, that inner supporters were requisite to its completion, and were undoubtedly used in the construction.

This point could not be ascertained without much time and labour, and would require also, I presume, the acquiescence and countenance of the Nawáb of Bhopál, in whose territory it is situated ; but I conceive that no hesitation would be made to this on the score of its creating jealousies, as the monument is of a nature which prevents the orthodox Hindu from visiting it, and the Jainas, as well as every other class, have become totally indifferent regarding it.

As dilapidation has commenced, the ravages of a few years, most probably, will cause the whole to fall into a mass of ruin, destroying the inuer apartments aud images, if any, and thus for ever depriving the curious from knowing what so wonderful a monument of human genius contains.

It is surrounded by a colonnade of granite pillars, 10 feet high, distant from each other a foot and a half, connected by parallels also of granite, of an elliptical form, united by tenons, leaving an area of 12 feet clear of the base of the monument, to which it strictly conforms.

Section and Plan of the Buddhist Monument at Sanchee on the west bank of the Betwa river near Bhilsa.



a a a, railing
A, Pedestal and broken image.
B,B,B, Images of Buddha.
C, Ditto with elephant.
D, Broken pillar 32 ft. high.
E, Small polished pillar.
F, Ruins of a hall.
G, Small temple.
H,K,L,M,N, Bearings of other temples &c.

J. B. Tassin lith.

At the east, west, and north points, are gate-ways, plain parallelograms, the extreme height of each of which is 10 feet, and the breadth within the perpendiculars, 9 feet. They all measure 20 feet to the lintels, which are slightly curved and sculptured, with circlets of flowers. In the northern gate-way, which is the principal one, the lintel rests on elephants, four feet in height, richly caparisoned, horne by a projecting cornice, 16 feet from the case. The perpendiculars are divided into four unequal compartments; in the lower are statues of door-wardens, in long loose drapery, the left hand of each figure resting on the left side, and the right grasping a battle-axe; their head dresses are not unlike the matted-hair tiara of Hindu devotees, with the top-knot thrown forward.

The other divisions are filled as follows: In one is a groupe of females, some sitting, others kneeling in homage to a tree and altar, their hands uplifted, and faces towards the tree, their countenances bearing marks of extreme devotional fervour. In another, the principal figure is a male, clothed in a long flowing garment, resembling a surplice, standing with joined hands, and in the act of adoration to the tree and altar, which throughout the sculpture appear to be the objects of veneration. This male figure is attended by females, some holding umbrellas over his head, others using chowries; above these, on a level with the top of the tree, are small winged figures, making offerings in censers.

The drapery throughout the groupe is generally, for the females, a long flowing vest, resembling that which we observe in Grecian sculpture; that of the males, light lower garments from the navel as far as the middle of the thigh, tied with a knot in front, and hanging down as low as the instep, as in the present Indian mode of dressing. The upper part of the body is naked, without any mark of a sacerdotal thread; and, with a very few exceptions, the head dress is a high turban, with plumes.

In another compartment is a representation of the monument, surrounded by figures in groupes, some standing, others sitting cross-legged, others bowing, all with joined hands, and in the act of worship. On the monument, and resting on a square pedestal, are three layers jutting out beyond each other, crowned by a lofty umbrella, supported by small winged figures, naked, their hands joined, and heads covered with numerous serpent hoods.

On entering the different gate-ways, is seen a statue of Buddha, as large as life, seated cross-legged on a throne, which is supported by lions couchant; the back of the image rests against the buttress, and has attendants on both sides using chaurís. All of these are much mutilated, and one is removed and thrown across the area.

The perpendiculars of the western gate-way, are also divided into four unequal compartments; in the lower are statues of door-keepers, one of whom is armed with a mace: his head dress, a helmet, without visor or plumes; another division is filled with groupes of figures sitting cross-legged, and standing, their hands joined, and all paying high homage to the sacred tree and altar. In another is a small convex body in a boat, the prow of which is a lion's head, and the stern the expanded tail of a fish, over which is suspended a long cable. In the boat are three male figures, two of whom are rowing, and the third holding an umbrella over the convex. The vessel is in an open sea, in the midst of a tempest; near it are figures swimming and endeavouring by seizing piles, &c. to save themselves from sinking. One on the

point of drowning, is making an expiring effort to ascend the side ; the features of all fully pourtray their melancholy situation.

In another compartment is the sacred tree and altar, surrounded by groupes of figures, both male and female, some beating tympans, others playing cymbals, others dancing ; the winged figures before described attend above the groupes. The lintel of this gate-way is borne by the uplifted hands of five uncouth dwarf figures, five feet high, with thick lips and flat noses, their hair curly, and having large protuberant bellies, appearing as if on the point of being crushed beneath the immense burthen they are supporting ; in short, it is hardly possible to conceive sculpture more expressive of feeling than this.

A representation of the grand monument fills another compartment of one of the perpendiculars. (See plate xxvii.)

The eastern gate-way is of the same dimensions as the others, with door-wardens armed with maces. Two of the compartments in each perpendicular comprise a procession leaving the gates of a city in progress to the tree and altar, near which is a human being, his hands strongly corded above the wrists, and held by another. The procession consists of horsemen, footmen, elephants, and short-bodied cars, drawn by horses: the latter crowned with plumes, all highly finished. The head-dress of the figures seated on the cars is the Roman helmet, with the plumes and hair. The whole is preceded by footmen, armed with circular shields and clubs, followed by a band of musicians playing flutes. The head-dress of the groupe running by the side of the cars differs from that of all others, being a closely-fitting turban of circular folds, most exquisitely delineated, on the top of which is a small globular crown.

Another compartment is filled with figures of devotees of different orders, performing various penances. In another division are three figures, with long beards, (the only figures of this description seen throughout the whole building,) seated in a boat in an open sea, at the bottom of which are seen various kinds of shells, alligators, &c. Underneath the ocean, and as if supporting it, are three male figures, and one female, the central male figure with uplifted hands, and his back outwards, the female in the act of praying to him. The whole of this groupe are clad in long loose vests, and the head-dresses of the males resemble mitres. On both sides of the groupe are the winged figures, the tree, and altar.

The lintel of this gate-way is supported by elephants, richly caparisoned, and resting on projecting horizontal cornices.

The capitals of the several gate-ways are crowned by figures of lions, elephants, naked and clothed statues, and images of various birds and beasts.

On the south, there is a plain entrance, near which is a double colonnade of quadrangular pillars, 20 feet high, most curiously set up, and forming an almost oval apartment. Near this lies a large obelisk, in circumference nearly equalling the Láth of Firoz Sháh, near Delhi. On the part which is uppermost, I could not observe any inscription ; it is worked with a string of flowers.

At the door of the apartment above mentioned, is the lower part of a statue of Párswánáth, smaller than those of Buddha in the gate-ways, resting on a throne which is supported by lions couchant on a pedestal, on which is an inscription, but so much obliterated, that I could make nothing of it, although the few letters that partially remain are Sanscrit. Near this is also a pillar, 14 feet high and 3½ in circumference, crowned with lions and tigers.

In front of and about 60 feet from the eastern gate-way, lie the shafts of two obelisks, about 10 feet in length, broken from the bases, which formed an entrance 14 feet in width ; on these I confidently expected to find an inscription, but was disappointed.

The whole has been surrounded by a stone wall, varying in distance from the monument, from 60 to 400 feet. It is 12 feet thick, and 8 feet high, built without cement ; at the four intermediate points were gate-ways, similar to but on a smaller scale than those in the colonnade around the monument.

The wall has fallen into general decay, and only one gate-way now remains, which is on the north-east.

In the upper compartments of the perpendiculars are female figures, naked and fettered, supporting on their heads a circle divided into 27 equal parts ; there are also figures holding snakes, standing close to a small relievo representation of the monument, in the body of which is a small aperture. This, as I have before said, serves to strengthen the opinion of apartments existing within. The lintel is slightly sculptured with circles of flowers in the same manner as in the others. It is supported by five uncouth dwarf images, with thick lips, curly hair, and their features expressive of the immensity of their burthens.

The upper parallels are beautifully sculptured with hooded serpents, passing through them in spiral wreaths. In that part of the outer hall which is still entire, are small flat-roofed apartments, 12 feet square, in most of which are large mutilated images of Buddha.

In a larger apartment, which stands opposite the eastern entrance to the monument, the roof of which is flat, and supported by a double row of granite pilasters, is a gigantic statue, the profile of the face measuring 13 inches from the fore-curls to the chin ; the nose and lips are much disfigured, and both arms are broken off below the elbows. This appears to have been more highly finished than any other. In the same apartment, on the right, is an image of Brahmá, with the sacerdotal thread, the front face mutilated ; the remaining, as well as all the tiaras, in excellent preservation. It measures three feet and a half from the throne, which is supported on two cobra capellas.

At the bottom, and in the centre of the supporters, which are diamond-cut, are alto-relievo figures of the Brahmánical order, their bodies thrown back in the act of attempting to avoid the heads of the serpents, which are not expanded, but projecting from under the throne, and turned as if endeavouring to ascend the columns.

On projecting pedestals, and in a line with the diadem, are small figures of Párswánáth, cross-legged ; another also crowns the centre. This is the only statue of the Brahmánical mythology which I observed throughout the different subjects of sculpture. In a corner of the same apartment, is an image of Párswánáth, over which are five expanded serpent-hoods, the only one which possesses this distinguished mark.

I was highly gratified at finding, on one of the pilasters, a Sanscrit inscription, with a date, which determined the structure to have been completed in the 18th year of the Samvat æra, or 40 years anterior to the birth of our Saviour.

There are numerous inscriptions on different parts of the colonnade around the monument, in a character almost totally unintelligible to me, though some of the characters are Sanscrit. I have taken fac-similes of a few.

About a quarter of a mile to the northward of this monument, is another, exactly similar to it in shape, but smaller, and built of free-stone, without any cement, each layer closely fitting, and not projectiug over each other as in the former; neither has this been covered with a coat of mortar. It has a buttress, which measures round the base 246 feet; the diameter of the superior surface, 19 feet. It is in perfect repair, not a stone having fallen, and is surrounded by a colonnade of granite pillars, of the same description as that encompassing the large one, giving a clear area of 8 feet.

Almost every stone of this bears an inscription in characters similar to each other; there is no sculpture, nor gate-ways, but numerous stones lie strewed around in the vicinity of both monuments, being parts of columns, capitals, mutilated images of Buddha, pedestals, tablets covered with sculptured figures of horsemen, elephants, lions, and almost obliterated inscriptions, &c. There is no reservoir for water, nor a single well within the whole enclosure, nor on the hill; but there is a pucka tank, and several wells lined with masonry, about a mile from the monuments, both of which are undoubtedly co-eval.

Any antiquary, skilled in research, would here find employment and amusement, for some time; even the taking fac-similes of the numerous old Sanskrit inscriptions that I observed, (and more would perhaps be found if sought for,) would occupy some days. I lament exceedingly my want of sufficient ability in the art of drawing, to do justice to the highly finished style of the sculptures; and also my deficiency in technical knowledge, and in experience in the power of description, for which these monuments afford ample scope.

These defects, together with the very limited time I possessed for inspection, will, I fear, render my account less satisfactory than I could wish: indeed I am fully aware my description can convey but a very faint idea of the magnificence of such stupendous structures, and exquisitely finished sculpture,—but as I know of no previous description of them that has been given to the world, I have been emboldened to send it you with all its imperfections on its head.

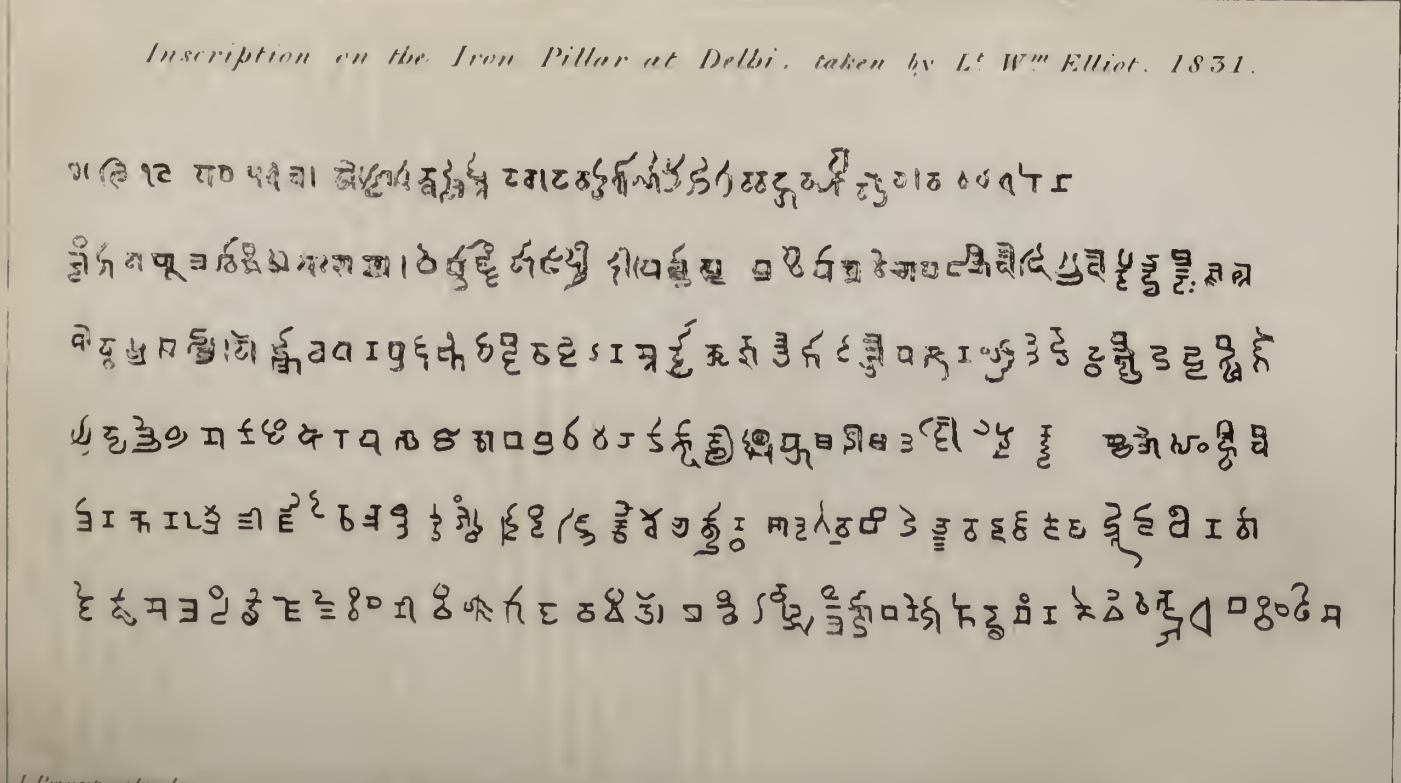
Hasingabád, Jan. 31, 1819. E. FELL.

IV.—*Inscription on the Iron Pillar at Delhí.*

Having prepared also in Plate XXX, an engraving of the inscription on the Iron Pillar at Delhí from a facsimile taken by the late Lieut. William Elliot, of the 27th Regt. N. I., at the request of the Rev. Dr. Mill, I think it as well to insert it in this place, although unprepared to give any account of its contents. Many of the letters agree with those of the Canouj alphabet, but the general aspect of them, I think, has greater conformity to the classical Deva Nágarí.

Those who are acquainted with Sanscrit are invited to aid in decyphering it. The first few letters appear to contain figures, probably conveying the date of the monument. J. P.

Inscription on the Iron Pillar at Delhi, taken by Lt. Wm. Elliot. 1831.



J. Prinsep reduced

V.—*Restoration and Translation of some Inscriptions at the Caves of Carlí, by the Rev.* J. Stevenson.

[In a letter to the Secretary, read at the Meeting of the 5th Nov.]

I have the pleasure to send you a copy of some of the inscriptions engraved on the excavated temple at Kárlí, near Puná (Poonah), along with an alphabet for decyphering them, and a translation.

It is now about a year since I first began to search, among the learned natives of this place, for a key to these inscriptions; but I was provokingly sent by the Marathás to the Kánarese, and by them again to the Támulians, and so on, without any result in an endless succession. I then made a collection of all the alphabets used on this side of India, and made the attempt, through means of them, to decypher the inscriptions; but still with no encouraging success. While engaged in these attempts, happily the March No. of your Journal was sent me by a friend, and through the aid it afforded me, in furnishing me with the alphabet of Inscription No. 2, on the Allahabad Pillar, with some little assistance from the sources above mentioned, I have been able to decypher some of our inscriptions; and hope that if you have not found the key to the character of Inscription No. 1, my alphabet may carry you several steps towards its attainment, and so repay the debt I owe for the assistance derived from your Journal.

Indeed I think the first 13 letters on the Allahabad stone, repeated again in lines 5th and 8th, and several times on the Delhi pillar, may, without much difficulty, be read as containing an address, probably to the Sun, in pure Sanskrita, as follows: द्वेधारं पिये पिय द्वसोभार्जमेद्वं which perhaps may be translated as follows:—" In the two ways (of wisdom and works?) with all speed do I approach the resplendent receptacle of the ever-moving luminous radiance." I do not however enter farther upon the decyphering of the inscriptions, found on the banks of the Ganges. Many important duties prevent me from allotting much time to studies of this nature, and the time I can spare for such a purpose, will be better spent in endeavouring to illucidate the history of the Dakhan (Deccan), from the numerous inscriptions in this, and the other ancient character, which are to be found up and down the country; assured, that the learned in Calcutta will soon reveal to us whatever mysteries the Allahabad and Delhí pillars conceal.

The inscriptions marked (A) (B) and (E), are in a letter of a different cast, and of about twice the size, of the others; and I almost fancy them somewhat more modern than the construction of the cave: but

the others, from the position they occupy, the apparently more ancient cast of the letter, and the damage they have sustained from time, are evidently coeval with the excavation of the temple. The other inscriptions on the temple, which I have not sent you, are all more or less imperfect, and are retained at present for farther investigation; as is also an inscription found in an adjoining cave written in the same character as No. 2, of the Allahabad pillar. The inscription A is all contained in one line of about 12 feet long, and the height of each of the letters is about five inches.

I give you no description of the temple itself, as I am informed that a particular description of it, will soon be published in the Transactions of the Royal Asiatic Society of London. It seems only necessary to say, that the images inside are all of the Buddhist class, while on the outside, the Buddhist and Bráhmanical are intermixed with one another.

From the inscriptions already decyphered, the following facts may, I think, be gathered.

1st. That the temple in question was excavated sixteen and a half centuries ago. The inscription (E), which contains the date, seems coeval with the sculptured images, and though in several places a little defaced, that part of it which contains the numeral figures, and a few letters both before and after, are happily in a state of perfect preservation. In order that no doubt might rest on this important point, I kept the inscriptions by me for two months, after decyphering them, and at last made a journey in the midst of the rains to the place, in order to ascertain whether or not my friend Lieutenant Jacob had copied them with perfect accuracy, before mentioning publicly the discovery I had made. The result of that examination was quite satisfactory, and left a full conviction on my mind, that there would be no doubt about the numeral figures. As to the era being any other than that of Shálivváhána, though that is not quite clear from the inscription taken singly, the mention of one of his successors by the unambiguous title, of "Ruler of the Shakas," in an adjacent inscription, of the same cast of letter, carries this point also beyond all reasonable doubt.

2nd. It seems evident that Shálivváhána's empire in the Dakhan, continued in great splendour, in the persons of his successors, for at least a hundred years after the commencement of his era, as is plain from their executing works of so much labour and expence.

3rd. It would appear, that the Buddhist was the religion at that time most favoured by the ruling party, though the Bráhmans, probably from their extensive influence among the lower orders, were thought of sufficient consideration, to have some of their images admitted into the society of the deified sages.

4th. That the Shakas did not come in numbers sufficient to supplant the language or literature of the Brahmans, whose learned language, the Sanskrita, they adopted to carry the memory of their deeds down to posterity.

5th. That since a character much simpler, and less artificial than the Deva Nágarí, was in use for writing the Sanskrita language over all the western parts of India, it, and not the Deva Nágarí, was, most probably, the character in which the Vedas, and most ancient compositions of the Hindus, were first committed to writing; and should those writings ever be carefully studied, and need conjectural criticism, this ancient character will also require to be studied.

6th. That the Arabic numeral cyphers had been introduced into India at the period above mentioned. The figure for one, and the two zeros in inscription E, are formed very nearly as they are formed in the Dakhan at the present day, and are united by a kind of hyphen as is still customary.

7th. That great caution must be exercised in admitting local traditions, in regard to such distant times. The universal tradition among the inhabitants of the Dakhan is, that all these caves were formed by the sons of Pa'ndu, when in banishment, wandering about the country; and I was at first inclined to believe, that when the Pándavas came to power, they might so perpetuate the memory of the places of their former retreat; but the temple at Kárlí belongs to a much later era, as we have seen, and probably the same is the case with those also at Verúl, (Ellora,) some of which greatly resemble it. The truth is, that it would be too much for modern Bráhmans to allow, that those who rejected the divine authority of the Vedas, could perform works, which the orthodox Hindus of modern times cannot equal, even though it should be at the expence of making the Pándavas encouragers of atheism.

I make no remarks on the proper names of kings, in the inscriptions, as I do not know that we have any lists of the descendants of Sha'liva'hana, that can be depended on. In proper names where the letters are not perfectly distinct, doubt must remain, from the absence of all aid from the construction and context.

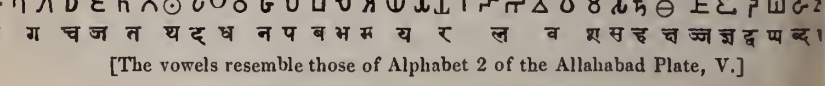
That your efforts for the promotion of science may be still more and more instrumental in clearing away the mists with which the Hindus have enveloped the history of their nation, and become the means of arousing many of them also to the zealous pursuit of true knowledge, is the ardent wish of Your obedient servant,

Poona, 17th Sept. 1834. J. Stevenson.

[The inscriptions will be found in the following page.]

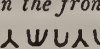
Facsimile of some of the Inscriptions found on the excavated Temple near Carlí, with the same in modern Deva Nágarí.

(A) Inscription on the cornice in the northern recess of the vestibule.



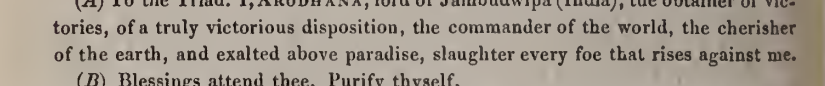
ओं विजयेगतम्सद्वीर्ज्जगताज्ञापोरसापाः परुपरोऽरोधनोहंजंबुद्वीपेशेऽरातिंशर्व्वे

(B) Inscription on the cornice in the southern recess of the vestibule.



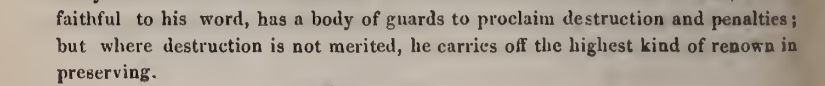
सिंच

(C) Inscription on the front of the Temple.



पवजवसरोरिनातोताथ्यसशणैः सथ्यतयपतयत्तधर्षशशोभोनारुहेरेशोगर्गः शकराजको
ल्लिरोनदद्दाशधातासत्यगीशकराजकोल्लिरनाभिद्देयापानेनावतसवीस

(D) Another Inscription on the front of the Temple.



ह्ट शंसकुरजराभ्टशवलाभिन्नारणारुचहेरुषुमत्तधीसोत
श्रीभूपाब्देऽपरिणे १०० धरोन्तोपुद्दमाश्रमाशयेताम्टतके
द्वाप्रपुंजिर्वाश्रेष्ठोवाभज [मानः कृतोस्ति]

(E) Inscription on the Pillar in front of the Temple.

शनारधीसांगगीपूतसमांगीशीतरकससिनाथगद्दारं

Alphabet as far as decyphered.

क ग च ज त थ द ध न प ब भ म य र ल व श स ह क्ष ज्ञ द्व ष्ट्र

[The vowels resemble those of Alphabet 2 of the Allahabad Plate, V.]

Translation of the above Inscriptions.

(*A*) To the Triad. I, Arodhana, lord of Jambudwípa (India), the obtainer of victories, of a truly victorious disposition, the commander of the world, the cherisher of the earth, and exalted above paradise, slaughter every foe that rises against me.

(*B*) Blessings attend thee. Purify thyself.

(*C*) Garga, the ruler of the Shakas, lord of the world-born* earth, though fleet as the wind-equalling arrow, moves on deliberately, paralysing the senses of every one who does not fall down before him. The ruler of the Shakas, who is faithful to his word, has a body of guards to proclaim destruction and penalties; but where destruction is not merited, he carries off the highest kind of renown in preserving.

* See Matsya Purána.

(*D*) Where the man-slaughtering demon Old-Age, of immense power, and muttering hoarsely, might, formerly, frantic, roam amid the horrid world-destroying devils, there, during the currency of the year of the prosperous cherisher of the world, (SHA'LIVA'HANA) 100*, this mountain-topping, hell-opposing, divine hermitage [was constructed], that the assembly of the illustrious immortals, and every noble and pious personage, might there take up their abode.

(*E*) Blessings attend thee. O Devotee, of an auspicious spiritual mind, having an unimpeded utterance, who art purified, and sound in all thy members; thou who art journeying towards our Supreme Lord, thou art now approaching the door.—Blessings attend thee.

[Mr. STEVENSON has, since the type for the above was cut, favored me with a lithographic copy of the same inscriptions, which differs in one or two trifling forms from the above. The transcript in Nágarí has been corrected by the lithographic version.—J. P.]

VI.—*Remarks on M. Remusat's Review of Buddhism. By* B. H. HODGSON, *Esq. Resident at the Court of Népál, &c.*

I resume my notice of REMUSAT's speculations on Buddhism in the Journal des Savans.

He observes, "On ne seroit pas surpris de voir que, dans ce système, la formation† et la destruction des mondes soient presentés comme les resultats d'une revolution perpetuelle et spontanée, sans fin et sans interruption;" and afterwards remarks, "Il y a dans le fond même des idées Bouddhiques une objection contre l'eternité du monde que les theologiens de cette religion ne semblent pas avoir prévue. Si tous les êtres rentroíent dans le repos réel et definitif à l'instant que les phénomènes cesseroient et disparoitroient dans le sein de l'existence absolu, on conçoit un terme ou tous les êtres seroient devenus Buddha, et ou le monde auroit cessé d'exister."

This Buddha, it is said, is "l'intelligence infinie, la cause souveraine, dont la nature est un effet."

Now, if there *be* such a supreme immaterial cause of all things, what is the meaning of alleging that worlds and beings are *spontaneously* evolved and revolved? and, if these spontaneous operations of nature be expressly allowed to be *incessant and endless*, what becomes of the apprehension that they should ever fail or cease?

As to the real and definitive repose, and the absolute existence, spoken of, they are as certainly and customarily predicated of *Diva natura* by the Swabhávikas, as of God or Adi Buddha, by the Aiswárikas; to which two sects respectively the two opposite opinions confounded by REMUSAT exclusively belong.

* A. D. 176.

† The question of formation is a very different one from that of continuance. Yet REMUSAT would seem to have confounded the two. See the passage beginning "Mais ce qui merite d'etre remarqué."

Again, "Tout est vide, tout est delusion, pour l'intelligence suprème (Adi Buddha, as before defined). L' Avidyá seul donne aux choses du monde sensible une sorte de realité passagère et purement phénomenal." Avidyá, therefore, must, *according to this statement*, be entirely dependant on the volition of the one supreme immaterial cause: yet, immediately after, it is observed, "on voit, à travers des brouillards d'un langage ènigmatique, ressorter l'idée d'une *double cause* de tout ce qui existe, savoir l'intelligence suprème (Adi Buddha) et l'Avidyá ou matière." But the fact is, that Avidyá is not a material or plastic cause. It is not a substance, but a mode—not a being, but an affection of a being—not a cause, but *an effect*. Avidyá, I repeat, is nothing primarily causal or substantial: it is a phenomenon, or rather the sum of phenomena; and it is "made of such stuff as dreams are." In other words, phenomena are, according to this theory, utterly unreal. The Avidyálists, therefore, are so far from belonging to that set of philosophers who have inferred two distinct substances and causes from the two distinct classes of phenomena existing in the world, that they entirely deny the justice of the premises on which that inference is rested.

Remusat next observes, "Les effets matériels sont subordonnés aux effets psychologiques"—and in the very next page we hear that "on appelle lois les rapports qui lient les effets aux causes, tant dans l'ordre physique que dans l'ordre moral, ou, pour parler plus exactement, dans l'ordre *unique*, qui constitue l'univers."

Now, if there be *really* but one class of phenomena in the world, it must be either the material, or the immaterial, class: consequently, with those who hold this doctrine, the question of the dependence or independence of mental upon physical phénomena, must, in one essential sense, be a mere façon de parler. And I shall venture to assert, that with most of the Buddhists—whose cardinal tenet is, that all phenomena are *homogeneous*, whatever they may think upon the further question of their reality or unreality—it is actually such.

It is, indeed, therefore necessary "joindre la notion d'esprit" before these puzzles can be allowed to be altogether so difficult as they seem, at least to be *such* as they seem; and if mind or soul "have no name in the Chinese language," the reason of that at least is obvious; its existence is denied; mind is only a peculiar modification of matter; et l'ordre unique de l'univers c'est l'ordre physique! Not 50 years since a man of genius in Europe declared that "the universal system does not consist of two principles so essentially different from one another as matter and spirit; but that the whole must be

of some uniform composition; so that the material *or* immaterial part of the system is superfluous."

This notion, unless I am mistaken, is to be found at the bottom of most of the Indian systems of philosophy, Brahmánical and Buddhist, connected with a rejection in some shape or other of phenomenal reality, *in order to get rid of the difficulty of different properties existing in the cause (whether mind or matter) and in the effect**.

The assertion that "material effects are subordinate to psychological" is no otherwise a difficulty than as two absolutely distinct substances, or two absolutely distinct classes of phenomena, are assumed to have a real existence; and I believe that there is scarcely one school of Bauddha philosophers which has not denied the one or the other assumption; and that the prevalent opinions include a denial of both. All known phenomena may be ascribed to mind *or* to matter without a palpable contradiction; nor, with the single exception of extent, is there a physical phenomenon which does not *seem* to countenance the rejection of phenomenal reality. Hence the doctrines of Avidyá and of Mayá; and I would ask those whose musings are in an impartial strain, whether the Bauddha device be not as good a one as the Bráhmanical, to stave off a difficulty which the unaided wit of man is utterly unable to cope with?

Questionless, it is not easy, if it be possible, to avoid the use of words equivalent to material and psychological; but the tenet obviously involved in the formal subordination of one to the other class of phenomena, when placed beside the tenet, that all phenomena are homogenous, at once renders the former a mere trick of words, or creates an irreconcileable contradiction between the two doctrines, and in fact Remusat has here again commingled tenets held exclusively by quite distinct schools of Buddhist philosophy.

If I have been held accountable for some of the notions above remarked on, I suspect that these my supposed opinions have been opposed by something more substantial than "des arguties mystiques." Remusat expressly says, "M. Hodgson a eu parfaitement raison d' admettre, comme base du *système entier*, l'existence d'un seul être souverainement

* Remusat desired to know how the Buddhists reconcile multiplicity with unity, relative with absolute, imperfect with perfect, variable with eternal, nature with intelligence?

I answer; by the hypothesis of two modes—one of quiescence, the other of activity. But when he joins "l'esprit et la matiére" to the rest of his antitheses, I must beg leave to say the question is entirely altered, and must recommend the captious to a consideration of the extract given in the text from a *European* philosopher of eminence. Not that I have any sympathy with that extravagance, but that I wish merely to state the case fairly for the Buddhists.

parfait et intelligent, de celui qu' il nomme Adi Buddha." Now, I must crave leave to say that I never admitted anything of the sort; but, on the contrary, carefully pointed out that the 'système entier' consists of *four* systems, all sufficiently different, and two of them, radically so—viz. the Swabhávika and the Aiswárika. It is most apparent to me that REMUSAT has made a melange out of the doctrines of all the four schools; and there are very sufficient indications in the course of this essay that his *principal* authority was of the Swabhávika sect.

In speaking of the two bodies of Buddha he remarks, that "le veritable corps est identifié avec la science et la loi. Sa substance même est la science (Prajná)." He had previously made the same observation, "Le loi même est son principe et sa nature." Now those who are aware that Prajná (most idly translated law, science, and so forth,) is the name of the *great material cause**, can have no difficulty in reaching the conviction that the Buddhist authority from whence this assertion was borrowed,—'of Prajná being the very essence; nature, and principle of Buddha,'—belonged to the Swabhávika school, and would have laughed at the *co-ordinate* doctrine of his translator, that Buddha is the sovereign and sole cause, of whom Nature (Prajná) is an effect.

The Swabhávika Buddhas, who derive their capacity of identifying themselves with the *first cause* from nature, which *is that cause*, are as all-accomplished as the Buddhas of the Aiswárikas, who derive the same capacity from Adi Buddha, *who is that cause*.

In this express character of sovereign cause only, is the Adi Buddha of the Aiswárikas distinguishable, amid the crowd of Buddhas of all sorts; and such are the interminable subtleties of the 'système entier' that he who shall not carefully mark this cardinal point of primary causation, will find all others unavailing to guide him unconfusedly through the *various* labyrinths of the *several schools*.

Did REMUSAT never meet with passages like the following?

"And as all other things and beings proceeded from Swabháva or nature, so did Vajra, Satwa, Buddha, thence called the *self-existent*,"

* *Prakritéswari iti Prajná*; and again, *Dháranatmika iti Dharma*. *Dharma* is a synonyme of *Prajná*. *Prajná* means Supreme Wisdom. Whose? Nature's—and Nature's, as the sole, or only as the plastic, cause.

So, again, *Dharma* means morality in the abstract, or the moral religious code of these religionists, or material cause, in either of the two senses hinted at above; or, lastly, material effects, viz. versatile worlds. These are points to be settled by the context, and by the known tenets of the writer who uses the one or other word: and when it is known that the very texts of the Swabhávikas, differently interpreted, have served for the basis of the Aiswárika doctrine, I presume no further caveto can be required.

Even the Swabhávikas have their Dhyáni Buddhas, and their triad, including, of course, *an* Adi Buddha. Names therefore, are of little weight; and unmeasured epithets are so profusely scattered on every hand that the practised alone can avoid their snare. I did not admit a Theistic school, because I found a Buddha designated as Adi, or the first; nor yet because I found him yclept, infinite, omniscient, eternal, and so forth; *but* because I found him explicitly contradistinguished from nature, and systematically expounded as the efficient cause of all. Nor should it be forgotten that when I announced the fact of a Theistic sect of Buddhists, I observed that this sect was, as compared with the Swabhávika, both recent and confined.

If, in the course of this, and the three preceding letters, I have spoken harshly of REMUSAT's researches, let it be remembered, that I conceive my labours to have been adopted without acknowledgment, as well as my opinions to have been miserably distorted. I have been most *courteously* told, that "the learned of Europe are indebted to me for the *name* of Adi Buddha!" The inference is palpable that *that* is the extent of the obligation. Such insidious injustice compels me to avow in the face of the world my conviction that, whatever the Chinese and Mongolian works on Buddhism possessed by the French Savans may contain, no intelligible views were thence derived of the *general subject* before my essays appeared, or could have been afterwards, but for the lights those essays afforded*. I had access to the original Sanscrit scriptures of the Buddhists, and they were interpreted to me by learned natives, whose hopes hereafter depended upon a just understanding of their contents. No wonder therefore, and little merit, if I discovered very *many* things inscrutably hidden from those who were reduced to consult barbarian translations from the most refined and copious of languages upon the most subtle and interminable of topics, and who had no living oracle ever at hand to expound to them the dark signification of the written word—to guide their first steps through the most labyrinthine of human mazes†.

For the rest, and *personally*, there is biensèance for biensèance, and a sincere tear dropped over the untimely grave of the learned REMUSAT.

* The case is altered materially *now;* because my original authorities, which stand far less in need of living interpreters, are generally accessible. I have placed them in the hands of my countrymen and of others, and shall be happy to procure copies for any individual, or body of persons, in France, who may desire to possess them.

† I beg to propose, as an experimentum crucis, the celebrated text—*Ye Dharmanitya* of the *Sata Sanasrika*. If the several theistic, atheistic, and sceptical meanings wrapped up in these few words, can be reached through Chinese or Mongolian translations uninterpreted by living authorities, I am content to consider my argument worthless.

VII.—*On the Use of the Siddhántas in the Work of Native Education. By* Lancelot Wilkinson, *Esq. Bomb. C. S., Ast. Res. at Bhopál.*

May I request that you will be so kind as to give insertion in your Journal to the accompanying few verses, extracted from the Goládhyáya, or Treatise on the Globes, by Bháskar A'chárya, Hindu Astronomer, who flourished about 800 years ago.

In order to make the tenor of the arguments here used by Bháskar A'chárya intelligible to readers generally, it may be proper in the first place, briefly to notice the popular belief and tenets entertained with regard to the earth and the system of the world, (for to these subjects my remarks will be confined,) by the two grand classes of Hindus here, so boldly and ably exposed by this celebrated Astronomer.

The Hindus of India seem to have been at the time when he wrote, as at the present day, divided into three grand classes; viz. 1st, the Jains or Bauddhas, followers of the Bauddha Sútras; 2nd, the followers of the Brahmánical or Puránic system; and 3rd, the jyotishís or followers of the Siddhántas or Astronomical system.

The Jains at that time maintained, and still maintain, that the earth is a flat plane of immense extent; that the central portion of it, called Jambudwíp, is surrounded by innumerable seas and islands, which encompass it in the form of belts; that the earth now is, and has been, since its first creation, falling downwards in space; that there are two suns, two moons, and two sets of corresponding planets and constellations; viz. 1st, for the use of that part of the earth lying to the north of the mountain Merú, believed to be in the centre of Jambudwíp; and the other for the use of the southern half of the world. The moon they believe to be above the sun, but only 80 yojans*; Mercury, four yojans beyond the moon; and Venus, to be three yojans beyond Mercury. The Jain banyas, scattered through the cities and towns of Rájputáná, Málwá, Guzerát, and the north-west provinces of Hindusthán, profess this belief. The opulent Márwárí merchants and bankers, whom we find established at the three presidencies, and in all the large cities of India, are also chiefly of this persuasion. Their Gurús are the Jattís; the Sarangís are also a stricter sect of Jains.

2nd. The followers of the Puráns believe in a system very little different from that of the Jains. They also maintain that the earth is a circular plane, having the golden mountain Merú in its centre; that it is 50 crores of yojans in superficial diameter; that Jambudwíp (which immediately surrounds Merú, and which we inhabit) is

* A yojan is four côs.

one lakh of yojans in width; that this dwíp is surrounded by a sea of salt-water, also one lakh of yojans in width; that this salt sea is encompassed by a second dwíp of two lakhs of yojans in breadth, and it again by a sea of sugar-cane juice of the same width; that five other belts of alternate islands and seas (each island being of double the width of its predecessor, with a sea of the same width as its adjacent island), succeed each other in regular order. The seas are of fermented liquor, ghí, milk, dhaí, and sweet-water. The Puráns assert, that the earth is not falling in space as the Jains maintain, but is supported by the great serpent Shesha. Such at last is the assertion of the Bhágavata, the most popular of the Puráns. In others, the task of supporting the earth is allotted to the tortoise, or to the boar Varáha. The Puráns maintain that there is but one moon and one sun; that the moon however is at a distance from the earth double of that of the sun; that the moon was churned out of the ocean; and is of nectar; that the sun and moon and constellations revolve horizontally over the plane of the earth, appearing to set when they go behind Merú, and to rise when they emerge from behind that mountain; that eclipses are formed by the monsters Ráhú and Ketú laying hold of the sun or moon, against whom, as well as against all the other deities of heaven, they bear implacable enmity. Vyásjí is believed to be the author of all the Puráns; he was probably the compiler of them; he is revered as divinely inspired. Shankar A'chárya, who flourished about 400 or 500 years ago, distinguished himself as a supporter of this system and as an enemy and persecutor of the Jains; he was also a reformer, but his reforms were confined to morals, and to religious institutions and sacraments. The followers of the Puráns are by far the most numerous of the three classes. The bráhmans, generally the rájpúts, kaiths, and indeed the mass of the population throughout India, all belong to this class.

3rd. The jyotishís or followers of the Siddhántas believe in a system widely differing from both of these. Their system is, with the exception of a few inconsiderable differences, that of Ptolemy. They teach the true shape and size of the earth, and the true theory of eclipses. The earth they place in the centre of the universe, around which revolve in order, as taught by Ptolemy, the moon, Mercury, Venus, the sun, Mars, Jupiter, and Saturn. The irregularities in the motions of the sun and moon they account for by supposing them to move, as also did Ptolemy, in epicycles, whose centres revolve in their circular orbits. The authors of the Siddhántas, and especially Bháskar A'chárya, the author of the most recent and most popular Siddhánta, called the "Siddhánta Siromani," have spared no pains to expose and

ridicule the monstrous absurdities of the Jain Sutrás and the Puráns. They have always professed in their writings the greatest admiration for the learned men of the West, the Ionians or "Yavans;" whilst the Puráns have denounced those who hold any communication with men of these nations, termed by them the lowest of the low. A'RYA BHA'T, the author of the A'rya Siddhánta, expressly maintains the daily revolution of the earth on its own axis, though not its annual revolution.

It is the object of this essay to draw the attention of the public, and especially that of all friends of native education to these Siddhántas, and to recommend them to more general attention and study than they have yet found. It will be asked, "Are you of opinion that they contain any thing which has escaped the research of DAVIS, COLEBROOKE, and BENTLEY, and which may yet throw some new light on the science of Astronomy, on Chronology, or on History?" I must answer, No. But I feel assured from experience, that they afford us beyond all comparison the best means of promoting the cause of education, civilization, and truth, amongst our Hindu subjects.

4th. Here I shall be at once met with the question, "Why go back a thousand years in search of truth avowedly containing some admixture of error, when the pure and the unadulterated truth is at hand, and may be communicated with equal facility?"

To this I reply, that the pure and unadulterated truth not only cannot be communicated with equal facility, but is absolutely rejected by the mass of the Hindu population of India; but that with the aid of the authority of the Siddhántas, the work of general and extensive enlightenment may be commenced upon at once, and will be most readily effected, the truths taught by them being received with avidity. To explain and correct their errors will at the same time be easy.

5th. With regard to the population of the three Presidencies, the argument of my supposed opponent may, and I believe, does, apply. The native mind there is fully prepared, nay, eager, to receive any cultivation that can be given to it; but what has led to this? For generations, indeed, I may say for centuries past, the native populations there have enjoyed the humanizing advantages of daily intercourse with enlightened Europeans and foreigners of all nations; of a moderate and steady government; and of an extensive foreign commerce; there too the bráhmans and the studious have for the same long period, had the benefit of many schools, colleges, and learned institutions, superintended by English teachers, distinguished for their learning and science; there the Press, English and Native, disseminating its daily modicum of knowledge, has at length succeeded in awakening a spirit of inquiry

and discussion, and taught the people the grand uses and advantages to which it may be applied; and there the Missionary, for generations past, has never intermitted in his sacred labours to root out the wide-spread degrading superstition, and to plant in its stead the seed of the purest morality and of true religion. There, in short, the populations have already advanced far in their course of civilization.

6th. But how widely different is the state of all the rest of the vast continent of India; at least of all Central India, including Nágpur, Berár, Málwá, and Rájputáná, in which my own personal experience has lain. The mass of the population is as rude and barbarous, and ignorant, and superstitious, as it was 17 years ago, when the supremacy of the British Government was first established. Of all the advantages, which have contributed to the enlightenment of the Native mind at the several seats of Government, it cannot be said to have enjoyed even one. What reception then can the announcement of the pure truth be expected to experience amongst a people in such state? With what reason can it be hoped, for a moment, that the English language and English literature, with its varied stores of knowledge, can here receive any cultivation? Even the most learned of the Hindu population find it impossible to comprehend, without assistance, the very best of our translations into their own languages. The native mind, habituated to the idlest absurdities, has neither relish nor taste for plain sober truth.

7th. Is it your opinion then, it may be asked, that the example of the Jesuit Missionaries of the south-west of India should be followed, and that the truth, to make it agreeable to the present state of the native mind, be dressed up in all the fantasies of a foolish superstition? By no means; I would on no account or in any degree degrade or compromise the simple dignity of sacred truth. But what prevents our availing ourselves of the circumstances which afford us the most powerful means of dispelling from the land a darkness otherwise so hopelessly impenetrable; if it be at once seen, that the Siddhántas do afford to us these most favorable and encouraging circumstances, and that to give a command and powerful influence over the native mind, we have only to revive that knowledge of the system therein taught, which notwithstanding its being by far the most rational, and formerly the best cultivated branch of science amongst the Hindus, and notwithstanding its being the foundation of such little knowledge as they display in predicting eclipses and the like, has, from the superior address of the followers of the Puráns, and the almost universal practice amongst the jyotishís, of making all their calculations from tables and short formulæ, couched in enigmatical verses, been allowed to fall into a state of utter oblivion?

8th. But how is this lost knowledge to be revived ? I shall proceed to explain. In every petty hamlet, not only in Málwá, Rájputáná, and Berár, but throughout India, you will find the joshí or astronomer and astrologer: in towns you will find many, and in large cities, even hundreds. It is their business to expound the panchánga, or almanac, to proclaim feasts and fasts, to fix the marriage-day, to tell the times of sowing and reaping; and forewarn their flocks of unlucky days: their services in short are in constant requisition. They are conjointly with the Patwárís, the village school-masters. The village joshí can expound, but not work out the results given in his panchánga; that high qualification belongs only to the city joshí. But it must not be supposed, that the power to make a panchánga, requires a knowledge of even the first principles or elements of his science. The utmost of his knowledge is 20 verses composing the Tithí Chintámaní, and 100 verses of a little book called the Graha Lághava, with a power of using the tables attached to them. By these few verses he can not only find the places of the sun, moon, and planets, but also work out eclipses. But the operation may be called purely mechanical, or an effort of memory. He can find the equatorial gnomonic shadow, from thence deduce the latitude (or acshánsha); he can tell you the amount of chará (or ascensional difference); the deshantará (or distance in longitude); the sun's declination (or kránti): but is wholly ignorant as to what things in nature are expressed by these terms. The verses of the Graha Lághava and Tithí Chintámaní contain only abbreviated formulæ for calculations; their wording is uncouth, and to the uninitiated, more unintelligible than an enigma. But though the ingenuity displayed in thus abbreviating calculations is considerable, it has had the effect above noticed of superinducing an utter neglect of the Siddhántas, in which the principles of the science are so fully, and in many respects so rationally, explained. I have met and cross-questioned many hundreds of joshís of late years; but in this large number, have found only two men who had a rational and full acquaintance with their own system. One is Vaijna'th, purohit of the Maháráo of Kotah; the other, Jinchand, a jattí of great celebrity at Ajmere, and late of Jhulaí in Jypur. It is singular that neither of these are professed jyotishís; the former is expounder of the Puráns, and the latter a Gurú of the Jains. Oujain, once so famous for its learning, has not now a single Siddhántí jyotishí to support its great name. Indeed, so general and entire is the ignorance of most of the joshís of India, that you will find many of them engaged conjointly with the Puránic bráhmans in expounding the Puráns, and insisting on the flatness of the earth, and its magnitude of 50 crores of yojans in superficial diameter, as explained in them,

with a virulence and boldness which shew their utter ignorance of their proper profession, which had its existence only on the refutation and abandonment of the Puránic system. The Jains and all the followers of the Puráns of whatever caste you will find, on the other hand, betraying equal inconsistency in daily appealing to the panchángs of the jyotishí, and confidently maintaining the infallibility of their contents, though founded on a system with which the truth of their own is utterly inconsistent.

Of the sincerity of the ignorance of both parties there can be little doubt, from the profound veneration with which they, but especially the joshís, regard all the Siddhántas. The Súrya Siddhánta they firmly believe to have been communicated to men by the sun himself, the authors of all they believe to have been divinely inspired. These works are now thought to be, like the Vedas, wonderful displays of Divine wisdom, but totally beyond ordinary human comprehension. That man who has mastered their contents, they regard, and even fear as one possessed with superhuman powers.

10th. With this blind veneration and strong prejudice in favor of the Siddhántas, prevailing particularly amongst the joshís scattered all over India (and the latter are by no means an inconsiderable part of the learned of India), and in some degree, now also amongst the Jain and followers of the Puránas, can we for a moment hesitate in admitting the vast benefits to which the proper employment of these prevailing prejudices will lead ? How readily may a knowledge of the science, as taught in the Siddhántas, be recommunicated, especially to the joshís, whose lives are now idly spent in wading through unintelligible calculations deduced from the Siddhántas ? With what exultation will every man of ingenuous mind amongst them receive explanations making plain and clear what is now all unintelligible and dark ! They will not stop in simply admitting what is taught in the Siddhántas. Grateful to their European Instructors for bringing them back to a knowledge of the works of their own neglected, but still revered, masters, they will in the fulness of their gratitude, and from the exercise of their now improved powers of understanding, also readily receive the additions made during the last few hundred years in the science.

11th. From the extract now forwarded it will be at once seen, that there can be little or nothing which we have to teach in Geometry, Surveying, and Trigonometry generally, in Geography or Astronomy, of which Bhásker A'cha'rya has not already given us the first principles, and for enabling us to explain which, he will not afford us many new and also the most appropriate arguments, in as much as they will be

best suited to Hindu taste. And what can be more flattering to the vanity of the Hindu nation, or more grateful to their feelings and prejudices as men, than to see their own great and revered masters quoted by us with respect, to prove and illustrate the truths we propound. At the presidencies, and even at many large stations, we may prosecute with success a scheme for educating the people, by at once teaching them English, or by other means equally directly attacking all that is false and absurd in their belief. At these places, all the causes above enumerated concur to prevent the failure of such a scheme. But this plan of educating the mass of the people in the interior of India, where English can never be of any practical avail to any but a very few, is perfectly visionary; to hope to educate them by translations in the Roman character, is little less so. Even translations into their own language and in their own character are frequently, as above mentioned, wholly unintelligible to the best educated natives. I could quote many proofs of this, but the mention would be invidious; the obvious cause of failure in all these cases is, that in these schemes we make no account of men's passions and weaknesses and prejudices, and have neglected to consult their tastes and present state of knowledge. By pursuing the course I now advocate we sail with the current, favorable gales vastly accelerating our progress; by directly attacking on the other hand the strongest prejudices of our nature, as is done in the other case, we struggle with an adverse stream, and with baffling winds, and will be found to have struggled comparatively in vain.

12th. May I quote my own experience in proof of what is here advanced? Since I entered the country, I have been, I hope, a warm and zealous friend of the cause of education, and have always bestowed much time and much labour upon the superintendence of such schools as have been located within the sphere of my influence. The school-books used, have been those printed at the Presidencies of Calcutta and Bombay.

But about two years ago, wishing to know how the joshís, generally so ignorant, succeeded in predicting eclipses, I went through the Tithí Chintámaní, and Graha Lághava. Finding them to contain only unintelligible and abbreviated formula, I was referred to the Siddhántas. These I had great difficulty in procuring, and still greater in procuring men capable of explaining their contents. By perseverance I have succeeded in gaining a limited acquaintance with their first principles. During the last four or five months, I have availed myself largely of these Siddhántas in teaching not only the boys of the Sehore school, but also adults, the joshís and bráhmans of the town. I beg leave to assure you, that in this short time I have succeeded in communicating

more real knowledge and information than I have done in the previous ten years of my Indian life.

A few days ago, the boys of the Schore school and the joshís and bráhmans above mentioned, were examined by me in the presence of Captain WINFIELD and Dr. INGLIS, of this station, and Mr. MACLEOD, Assistant to the Agent to the Governor General at Jabbalpur. I confidently appeal to these gentlemen to pronounce whether the acquisitions of the students were not, considering the time devoted to the study, perfectly astonishing.

13th. It may be thought that I am here advocating too exclusive an attention to scientific education and the abstract sciences. I feel assured, however, that this will prove our shortest course also to moral improvement. Till the situation of the countries spread over the face of the globe is known, what credit can our histories gain; what impression can they make on men's minds? They may as well relate to nations existing in the moon. Till conviction of the truth of the Siddhántic system, as to the size and shape of the earth, is felt, the popular absurdities of the Puránic cosmogony will never be abandoned. I rest not merely on my own opinion and experience; I adduce that of an institution founded by a society, whose labours for the improvement of India have been most useful and exemplary. I allude to the American Mission's Seminary at Jaffna, in Ceylon, in the 2nd page of whose 3rd triennial report, published in 1833, it is stated, "that an examination of the Puránic system of geography and astronomy, compared or rather contrasted with the Copernican system, has been attended to with greater interest, and been productive of more obvious advantages, than almost any other branches of study."

The Professors of this establishment, however, do not seem to have been aware of the existence of the Siddhántas; or to have known that BHA'SKAR A'CHA'RYA had already spent the whole force of his science and ridicule in exposing the absurdities and impossibilities of the Puránic system. What European, gifted with the utmost tact and wisdom, with the most intimate knowledge of the native character, their customs, beliefs and languages, and the highest flow of eloquence in the use of them, can, by appeals to reason, by arguments and proofs, hope to work upon an ignorant and prejudiced people any effect compared to that which may be produced by a dexterous use of its blind and prejudiced veneration for authority?

14th. I may here quote another instance of the practical service recently rendered to me in my official capacity, when I was officiating as Political Agent at Kotah, by these Siddhántas. The officers employed on the grand trigonometrical and other surveys, have always experi-

enced, in almost every part of India, the greatest obstructions in the discharge of their duties, from the prejudices and ignorance of the people and their native princes. At Kotah, no less ignorance and prejudice had been displayed than elsewhere: so strong were the suspicions entertained by the late Ráj Ráná Madhu Singh, of the designs of the British Government, when Captain Paton, the Deputy Quarter-Master General at Nímach, entered his territories to survey certain roads, &c. and so reiterated his objections in reply to the Agent, Captain Ross's assurances, that the last-mentioned officer was at length obliged to request Captain Paton to withdraw. Whilst at Kotah, I received orders from Government, desiring me again to use my influence with the Ráj Ráná to prevent all further obstructions. Upon this, I sent for Vaijna'th, the astronomer above mentioned, and for the Ráj Ráná's joshí, and found no difficulty, by the help of the 33rd verse here quoted, and others treating more at length on the subject, in satisfying them of our real object. They equally soon procured for me an intimation from the Ráj Ráná, that his co-operation would in future be readily given to the officers deputed to survey his territories.

15th. From the arguments and facts above recorded, the natural conclusion appears to me to be, that it will be our wisest course, at the same time that we afford every encouragement to the study of English by those who are likely to find use for it, or have leisure and talents to prosecute it with effect, to give every encouragement to the study of the Siddhántas; and to the explanation of their contents, first to the jyotishís, whose profession is founded on the principles given in them, and through them to all their flocks. Where is the native of India, however poor, who is not constantly consulting his jyotishi?

I would therefore recommend that no time be lost in giving to the world the best printed editions of the Siddhánta Siromaní of Bha's-kar A'chárya, including the Goládhyáya, or Treatise on the Globes, and the treatises on Algebra and Trigonometry; of the Súrya Siddhánta, and of that of A'rya Bha't, with Prithudak's commentary, the author who maintains the diurnal though not the annual revolution of the earth.

The Graha Lághava (which, as far as my inquiries extend, seems to be in almost universal use over the greater part of India,) will perhaps be even of more use than the Siddhántas, if accompanied by the most excellent and rational commentary of Malla'rí. Almost all these works contain a chapter on the construction and use of the globes. These the natives at our colleges should be encouraged to construct accordingly, and to compare and contrast them with our globes, without which no school or college in India ought to be. My own pandit and

the bráhmans of Sehore, who have become converts to the Siddhánta and our system, all express the utmost anxiety to get globes if possible in Hindi, convinced that they will prove to others as they have done in their own case, the readiest means of demonstrating to them the truth.

16th. It is strange and deserving of remark, that though astronomy is the science which has been most cultivated by the Hindus, and has most attracted the notice of the learned in Europe, and, as above shewn, is also best calculated to promote the work of education, still not a single standard, or indeed any work whatever on this subject, has yet been printed in India. From Mr. Lushington's History of the Calcutta Institutions, it appears in pp. 126, 127, that in the Government Sanscrit College the Jyotisha Shástra is not even embraced in the course of study pursued there. It surely has incomparable advantages over the Hindu systems of Logic, Rhetoric, Prosody, and even over Law and Grammar, as far as education is concerned, essential though the last mentioned be. So entirely have we neglected the study of late years, that Professor Schlegel (as I observed from a late number of your Journal) takes credit to himself for being the first to expound to the European scholar, the method used by the Hindus in their astronomical works, of expressing numbers by symbolical words. You seem inclined to give to the learned Professor great credit for having unravelled this mystery in the absence of native pandits. It is by no means my wish to detract from the merits of the learned Professor; but surely when every astronomical work is accompanied by a commentary, explaining in plain language, and also in figures, the symbolical expressions of the text, little credit is claimable for unravelling a mystery already made plain. Under these circumstances, it is by no means strange, that Messrs. Colebrooke, Davis, Bentley, and Jones, thought it unnecessary to offer any explanations on a method at first sight so mysterious, but so palpable on referring to the commentary which almost invariably accompanies the text.

17th. But to return to the subject in hand, it seems to me most desirable, that the books above-mentioned should be published without delay; at present revered though they are, they are exceedingly difficult to be procured. Any gentleman moderately conversant with Sanscrit, and with the elements of the science of astronomy, will, if he have leisure, readily master all they contain in a very few months. This accomplished, how largely will his powers of superintending the work of education, and especially that of translation, be augmented! I trust that not a few of the many ardent friends of education will avail themselves of the advantages to be derived from these

works here set forth, and give to the native public, translations in the vernacular languages, with such corrections, improvements, and additions, as will place the Hindus at once in possession of all the recent discoveries of Europeans. At no place have more elementary scientific works been translated and printed than at Bombay, chiefly under the superintendence of the late zealous and accomplished Secretary to the Bombay Education Society, Major George Jervis of the Engineers; but the usefulness of his labours is much detracted from, by his omission to make use of the terms, and mathematical phraseology, perfectly well understood by scientific Hindus, if not by bráhmans generally, and by substituting others of his own coining, which must be wholly unknown to them. The term Spársha Rekhá, (for the tangent,) and several others for lines, &c., which the Hindus have never used or known, are in themselves highly appropriate and unobjectionable.

18th. I now beg to draw your particular attention to the original extracts, which appear to me most curious, and calculated to prove to others as it has done to myself, most valuable and useful.

In the first three verses Bha'skar A'cha'rya, after stating the earth to be a sphere poised in space, exposes in a most rational and forcible manner, the Puránic doctrine of its being supported by the grand serpent Sheshá, or any material thing.

In the 24th and 25th verses, our author shews, that he had got a glimpse of the true nature of attraction and gravity; he then proceeds in the 26th, 27th, 28th, and 29th verses, to expose in his own way (not altogether philosophical), the Jain articles of belief, that the earth is perpetually falling in space, and that there are two suns, two moons, and two sets of constellations.

In the 30th, 31st, and 32nd verses, by a very rational argument, the modern Bráhmanical belief of the earth's flatness is exploded; he ridicules the idea of their immense mountain of gold, called Merú, and accounts for the apparent flatness of the earth.

In the 33rd, 34th, and 35th verses, he gives succinct general directions for the measurement of an arc of the meridian, and thence deduces the real magnitude of the earth, deriding the absurdity of the dimensions alleged in the Puráns.

In the 36th verse, he shews such a limited knowledge of geography, as would entail a whipping on any boy of eight years of age in Europe; but in the three last verses, he shews that he, 800 years ago, had such a perfect knowledge and conviction of the consequences resulting from admitting the spherical form of the earth, viz. of the existence of anti-

podes, &c. as the priests and princes of Europe could not be persuaded to entertain four or even but three hundred years ago; and for asserting which, they were sending our earliest philosophers to the dungeon.

19th. I take this opportunity of informing the public of the existence of a native observatory at Kotah, or rather of a valuable collection of astronomical apparatus, made by the late Mahárão Uhmaid Singh; and posited on one of the bastions of the citadel, fitted up for their reception. This apparatus consists of a very splendid and large armillary sphere; of the celestial and terrestial globes, dials, gnomons, and also the Ráj Yantra, or astrolabe, borrowed from the Musalmáns about 250 or 300 years ago. The axes of the globes are fixed at an elevation of 24° 30′, the supposed altitude of the North Polar Star at Kotá. But the latitudes given by the native astronomers, for all the principal cities of Rájputáná and Málwá, are under-rated by about 40′; that of Kotah is, I believe, 25° 10′. The authority of Bha'skar A'cha'rya has led to this error. In the 34th verse here quoted, the latitude of Oujain is stated at $\frac{1}{12}$ of 360°, which would give just 22° 30′. This accordingly is always stated by Native Astronomers as its latitude, and when I have stated the result not only of Dr. Hunter's but also of the celebrated Rájá Jay Singh's more accurate observations (vide vol. vi. Asiatic Researches); this verse has always been quoted to me to prove their assertions.

The Mahárão's collection contains also a Túriya Yantrá, or quadrant, with a radius on one side of 30 digits, and linear rectangular intersections, rising from each digit, representing their whole canon of sines, cosines, and versed sines adapted to this radius. From the Mahárão's astronomer I procured a copy of the Sanscrit treatise on the quadrant, called the Yantra Chintámaní, by Chakradhara, son of Sri Wámána, containing directions for the construction and use of the instrument, with the mathematical proofs and demonstrations of all the many problems which may be worked by it. The reverse side of this quadrant contains the signs and degrees of the ecliptic, and an hour circle, with an index-hand by which you are enabled to tell at once the lagna (or horoscope), that is, the exact point or star of the ecliptic, rising in the horizon at any given time.

I am unable at the present moment to fix the date of this work, but I am inclined to think that it is not of a much more ancient date than the astrolabe, and that it, like the astrolabe, has been borrowed from the Musalmáns.

To the European public, translations of this and the other works alluded to in this letter, would be highly curious and highly valuable. To enable us to communicate our greater knowledge in the sciences

they treat of, the study of them would seem indispensable, to give us a due command of their mathematical modes of expression. I earnestly hope, that some persons better qualified than myself, may be induced to undertake the task of translation. I do not refuse the task; but I confess my present incompetence, from my own limited knowledge of mathematics, to understand and follow the authors of these learned works in their more abstruse calculations; and the never-ceasing pressure of arduous and responsible public duties, prevents my devoting such time to the study as would better qualify me for the duty. It would be unjust in the public to expect, and imprudent in me to promise much; what I can, I will do. But the public may with much justice turn their eyes upon those men of science at the head of our schools, colleges, and literary institutions now scattered over India. To a Mill, a Yates, a Tytler, a Sutherland, a Thoresby, and many other distinguished scholars of this Presidency, and to the two Jervises of the Engineers, and to many gentlemen of the Scotch and American Missions, so much distinguished for their labours in the cause of education, on the Bombay side of India, the task would be easy; I hope it will not be declined.

Extract from Bháskar A'chárya's Treatise on the Globes.

भूमेः पिण्डःशशाङ्कःज्ञकविरविकुजेज्यार्किनक्षत्रकक्षा
दृक्षेर्दृक्षोदृतः सन् मृदनिलसलिलव्योमतेजोमयोयं ।
नान्याधारः स्वशक्त्यैव वियति नियतं तिष्ठतीहास्य पृष्ठे
निष्टं विश्वञ्च शश्वत्सदनुजमनुजादित्यदैत्यं समन्तात् ॥ २१ ॥

Verse 21st. This sphere of the earth, formed of the five elementary principles, viz. earth, air, water, the ethereal atmosphere, and fire, is perfectly round, and encompassed in the orbits of the moon, Mercury, Venus, Mars, Jupiter, Saturn; and lastly, by that of the constellations. It has no material supporter, but stands fixed in air by its own inherent force. On its surface, all living and inanimate objects subsist throughout, as well titans, as human beings, gods, as well as daityus.

सर्वतः पर्वतारामग्रामचैत्यचयैश्चितः ।
कदम्बकुसुमग्रन्थिः केसरप्रसरैरिव ॥ २२ ॥

Verse 22nd. Its surface is bespread on all sides with numberless mountains and groves, towns and buildings, as the bulb of the flower of the Kadamb tree is covered with filaments without number.

मूर्त्ता धर्ता चेद्धरित्र्यास्तदन्यस्तस्याप्यन्योप्येवमचानवस्था ।
अंत्ये कल्प्या चेत्स्वशक्तिः किमाद्ये किन्नो भूमेः साष्टमूर्त्तेश्च मूर्त्तिः ॥ २३ ॥

Verse 23rd. Let it be admitted, that this earth is supported by any material substance, or living creature, still for the support of that, a second supporter is

required, and for that second in like manner, a third is necessary. Here you have the absurdity of an interminable succession : if reduced to admit a power of self-support in that which you place the last of the series, I would ask, why not admit the same power in the earth itself, the first of the series? for the earth is one of the forms of the eight-fold divinity.

यथोष्णतार्कानलयोश्च शीतता विधौ द्रुतिः के कठिनत्वमश्मनि ।
मरुच्चलो भूरचला स्वभावतो यतो विचित्रा वत वस्तुशक्तयः ॥ २४ ॥

Verse 24th. As heat is the inherent property of the sun and of fire ; as cold of the moon, fluidity of water, and hardness of stones ; as the air is volatile, and the earth is immovable, and as other wonderful (oh! how wonderful!) properties belong to other things :—

आकृष्टशक्तिश्च मही तया यत् खस्थं गुरु स्वाभिमुखं स्वशक्त्या ।
आकृष्यते तत्पततीव भाति समे समन्ताक्व पतत्वियं खे ॥ २५ ॥

Verse 25th. In like manner, the power of attraction is inherent in this globe of earth. By this inherent power, any thing heavy projected into the air is attracted down to it. The thing so projected appears to be falling of itself ; but in fact, it is in a state of *being drawn downwards by the earth.* If, with the Jains you suppose the earth to be perpetually falling in space, in what direction, I ask you, is it falling ? Above and below and all around the ethereal expanse is equally outspread.

भपञ्जरस्थ भ्रमणाल्लोकादाधारशून्या कुरिति प्रतीतिः ।
स्वस्थं न दृष्टन्तु गुरुत्वमातः खेऽधःप्रयातीति वदन्ति बौद्धाः ॥ २६ ॥

Verse 26th. That the earth is poised in space, and without support, the fullest assurance is felt from beholding the revolutions of the circling constellations; but the Jains maintain, that it is perpetually falling downwards in space ; resting the proof of this assertion on the fact, that all heavy things naturally fall downwards, and that the earth is the heaviest of heavy visible things.

द्वौ द्वौ रवीन्दू भगणौ च तद्वदेकान्तरत्वाबुदयं व्रजेतां ।
यदब्रुवन्नेवमनंबराद्या ब्रवीम्यतस्तान्प्रति युक्तियुक्तं ॥ २७ ॥

Verse 27th. The Jains and others likewise maintain, that there are two suns, and two moons, and also two sets of constellations, which are rising in constant alternation. But to them I give this appropriate answer.

भूःखेऽधः खलु यातीति बुद्धिर्बौद्ध सुधा कथं ।
जाता यातं तु दृष्ट्वापि खे यत् चिप्तङ्गुरु चिंतं ॥ २८ ॥

Verse 28th. Let it be admitted, that the earth is falling downwards in space ; but O Jain, dost thou not see that every heavy thing projected into space, comes back again to, and overtakes, the earth? How then can your idle proposition hold good ? If true, a heavy thing once projected into air would keep at an uniform distance from, but never overtake, the earth.

किं गणं तव वैगुण्यं द्वैगुण्यं यो दृया छयाः ।
भार्कैन्दूनां विलोक्याङ्गा ध्रुवमत्स्यपरिभ्रमं ॥ २९ ॥

Verse 29th. What can I say to your folly, O Jain, who without object or use supposest a double set of constellations, two suns, and two moons? Canst thou not at times see the circumpolar stars revolving round the polar star, even in broad day-light ?

यदि समा मुकुरोदरसन्निभा भगवती धरणी तरणिःचितेः ।
उपरि दूरगतोपि परिभ्रमन् किमु नरैरमरैरिव नेक्ष्यते ॥ ३० ॥

Verse 30th. If this blessed earth were like the surface of a looking glass an extended plane, why should not the sun, even when removed to a distance from the earth, as at night, (the Puráns assert that it revolves in a horizontal circle, as it does when seen from the poles,) still be visible in every part of its revolution to men, as well as to the gods?

यदि निशाजनकः कनकाचलः किमु तदन्तरगः स न दृश्यते ।
उदगयं ननु मेरुरथांशुमान् कथमुदेति च दक्षिणभागके ॥ ३१ ॥

Verse 31st. If (the intervention of) Merú causes night, why is not this mountain, when between us and the sun, visibly developed to our eyes? Let it be granted that this Merú is, as is stated in the Puráns, situated to the north, pray tell me why should the sun ever rise at all in the south, as it does when it has southern declination?

समो यतः स्यात्परिधेः शतांशः पृथ्वी च पृथ्वो नितरां तनीयान् ।
नरस्य तत्पृष्ठगतस्य कृत्स्ना समेव तस्य प्रतिभात्यतः सा ॥ ३२ ॥

Verse 32nd. The fact is, that one hundredth part of the circumference of the earth is or may be assumed to be a plane. The earth is an excessively large body; a man is immeasurably smaller; and hence it is, that to him, as he stands on its surface, the whole earth has the appearance of being a plane.

पुरांतरं चेदिदमुत्तरं स्यात्तदक्षविश्लेषलवैस्तदा किं ।
चक्रांशकैरित्यनुपातयुक्त्या युक्तं निरुक्तं परिधेः प्रमाणं ॥ ३३ ॥

Verse 33rd. The measurement of the circumference of the earth is easily and correctly ascertained by the simple rule of proportion, in this way—there is a town situated to the south; you are residing in another lying due north of it; ascertain the distance between the two, and the difference of their latitudes; then say if the number of degrees (difference of latitudes) give this distance, what will the whole circumference of 360 degrees give?

निरक्षदेशात् क्षितिषोडशांशे भवेदवन्ती गणितेन यस्मात् ।
तदन्तरंषोडशसंगुणं सद्भूमानमस्माद्बहु किं तदुक्तं ॥ ३४ ॥

Verse 34th. Oujain, for instance, is ascertained by calculation to be distance from the equator, where there is no latitude, $\frac{1}{16}$ part of the whole circumference of the earth—this distance multiplied by 16, will be the measurement of the circumference of the earth: what reason then is there in asserting such an immense magnitude of the earth?

शृंगोन्नति ग्रहयुति ग्रहणोदयास्तछायादिकं परिधिना घटतेऽमुना हि ।
नान्येन तेन जगुरुक्तमहीप्रमाणप्रामाण्यमन्वययुजा व्यतिरेककेण ॥ ३५ ॥

Verse 35th. By assuming as true this circumference thus ascertained, the calculations of the position of the moon's cusps, the conjunctions of the planets, eclipses, the times of the rising and setting of the planets, and the lengths of the shadows of the gnomon, and the like, correspond with the observed facts. By assuming any other circumference, no such correspondence is found to exist. The truth of the above-mentioned measurement of the earth is thus plainly established by the law of "rule and exception" set forth in the Nyáya Shástri.

लंका कुमध्ये यमकोठिरस्याः प्राक्पश्चिमे रोमकपत्तनञ्च ।
अधस्ततः सिद्धपुरं सुमेरुः सौम्योथ याम्यो वडवानलश्च ॥ ३६ ॥

Verse 36th. Lanká is situated in the middle of this globe; Yamkothi is situated to the east of it; to the west is Romc or Romaka Patan; the city of Siddhapur is on the opposite side of the globe to that of Lanká. Sumerú is situated to the north, on the North Pole, and Baravanala to the south, at the South Pole.

कुष्टपादान्तरितानि तानि स्थानानि षड्गोलविदो वदंति ।
वसंति मेरौ सुरसिद्धसंघा ऐर्वे च सर्वे नरकाः सदैत्याः ॥ ३७ ॥

Verse 37th. These six places are situated at a distance of one-fourth part of the earth's circumference, each from its adjoining one; so say those who are acquainted with the globe. At Merú the various classes of the gods and pure spirits have their abodes: at Baravanala, at the South Pole, are situated the residences of all the evil spirits.

यो यत्र तिष्ठत्यवनिं तन्मन्यामात्मानमस्या उपरिस्थितं च ।
स मन्यतेऽतः कुचतुर्थमंस्था मिथश्च ते तिर्यगिवामनंति ॥ ३८ ॥

Verse 38th. A man, on whatever part of the globe he is placed, thinks the earth to be under his feet, and that he is standing upright upon it; men placed at the distance of 90 degrees, or one-fourth of the earth's circumference, from each other, fancy each other to be standing as it were at right angles to each other.

अधः शिरस्काः कुदन्तरस्थाः छायामनुष्यादव नीरतीरे ।
अनाकुलास्तिर्यगधः स्थिताश्च तिष्ठन्ति ते तत्र वयं यथात्र ॥ ३९ ॥

Verse 39th. Those who are placed at the distance of half the earth's circumference from each other, are antipodes each to the other, and fancy each that the others have their heads turned into directions exactly opposite, in exactly the same way, as a man beholding his shadow on the bank of a river.

But neither do those who are standing at right angles to each other, nor those with their heads turned into directions opposite to each other, feel any difficulty in maintaining their several positions. They stand as perfectly at ease in their respective positions, as we do here.

[We have had much pleasure in giving insertion to the above article, in the sentiments of which we entirely concur. While we endeavour to push our own systems of instruction and science in this country, we are too apt to spurn and decry the literature, the science, and even the languages of the east, as if they were not only incapable of imparting the smallest particle of knowledge, virtue or truth, but incapable also of improvement by engrafting upon them the new growth of western knowledge, which has sprung ahead of the Asiatic and elder stock only within the last century or two. Were the moralist to follow Mr. WILKINSON'S example, he could doubtless produce from the mental philosophy of the Hindus parallel maxims for most of those in our own moral code:—the selection of these;—their separation from the dross of the ancient schools;—and their presentation to pupils in this form, would doubtless work the same wonders in moral education, as has the Siddhánta system in the astronomical classes of Mr. WILKINSON. We trust this gentleman, evidently qualified by taste as by ability for the task, will favor the English reader with a full translation of the *Siromani*. The astronomical formulæ of the *Siddhánta* have been fully made known to us, but not the arguments and reflections with which they are accompanied.—ED.]

VIII.—*On the Land Shells of India. By Lieut.* Thos. Hutton, 37*th Regt. N. I.*

[Continued from the 26th No. of the Journal.]

I have the pleasure to inform you of the discovery of a few more species of Land Shells, made during a hurried trip between Nemuch and Mhow, in the month of December last.

26. The first is a species of Cyclostoma.

Animal—furnished with two cylindrical tentacula; eyes black, and placed at the exterior base of the tentacula; there are also two blackish points at the summits of the tentacula, which have the appearance of eyes; head very long, proboscidiform, and emarginate. The eyes causing a thickening of the tentacula. Colour pale brown; skin transversely wrinkled like that of a leech

Shell—with five whorls; spire prominent; whorls rounded: the sutures well defined; colour of the shell above varying considerably in different specimens; some being of a purplish brown, others brown, and some nearly white—this appears to be owing to the degrees of exposure to the sun, which the individuals may have undergone, as well as age. The colours are laid on in short crooked lines, transversely; alternately a brownish and a whitish stripe, very minute. The under side is white. Aperture circular, margins united and more or less reflected. Umbilicus well defined, discovering the three previous whorls. Operculum calcareous. Diameter half an inch.

Found buried at the roots of grass growing beneath low shrubs in uncultivated plains between Nemuch and Mhow.

27. Carocolla ———?

Animal—unknown.

Shell—white with a purplish band longitudinally placed on the body whorl above. Aperture oval and obliquely transverse. Umbilicus discovering the previous whorls—margins of the mouth reflected and interrupted on the body whorl, a thin plate interposing. Diameter about five and half or six lines; aperture longer than broad.

With the exception of the more contracted and obliquely transverse aperture of the present species, it would appear almost identical with the shell described by me, as a doubtful Cyclostoma (No 2) in the 26th No. of the Journal. Specimens of both were buried together.

Found in uncultivated plains, buried in the earth at the roots of coarse grass—between Nemuch and Mhow.—I found no operculum.

28. Helix ———,

Animal—with four tentacula, the superior pair longest, and bearing the eyes at the summits—colour freckled brown.—Foot long and rather tapering posteriorly.

Shell—with six whorls, globose, and the body whorl forming the greater portion of the shell.

In the living animal it is mottled with pale brown and black, from the thinness of the shell rendering the colours of the animal visible; but when dead, wholly of a dull white:—spire very little raised above the whorls; aperture lunated, margins acute; diameter 9 lines.

The animal stops up the mouth of the shell with a hard calcareous operculum, but which is only temporary, not being attached to the body.

Found buried in the earth with the foregoing beneath shrubs, in uncultivated grounds, between Nemuch and Mhow.

29. Helix ———.

Animal—with four tentacula, the superior longest and bearing the eyes at their summits; foot elongated and rather truncated posteriorly; colour pale yellowish brown.

Shell—with six whorls; spire moderately raised above the plane of the whorls; colour sandy; diameter, half an inch.

Found with the preceding.

These two specimens appear to be true Helices.—Unlike the species No. 3, described in the 26th No. they have no tentaculiform processes on the right side, playing over the surface of the shell when the animal is in motion, nor have they the fleshy hook on the tail.

The shell of the species which I formerly described with a mark of doubt as a Helix, is very like in form and general appearance to the present species, No. 29: but the polish of the shell is very superior to this last.

30. Achatina ———?

Animal—unknown.

Shell—with 10 whorls; pale sandy brown; spire obtuse; cylindriform; aperture longitudinal, subovate, right lip edged; pillar smooth, straight, and truncated at the base; length, $1\frac{1}{4}$ inches, smooth and shining.

Found buried in the earth, foot foremost, at the roots of shrubs, in uncultivated grounds, between Nemuch and Mhow.

Among these shells, I could observe no partiality for any particular aspect, nor any thing to confirm the opinion which I formerly hazarded, of this being one of the habits of the Land Shells. Nevertheless, I am still inclined to retain that opinion, because the circumstance may hold good with regard to those species which are more particularly found in rocky situations, and where the hot winds, striking throughout the day against the rocks, would of necessity impart a great and overpowering degree of heat to the retreats of these animals, even when

buried in the earth—while on the other hand, the species, which I have here endeavoured to describe, inhabiting wide and flat plains, are under no necessity of placing a farther barrier between themselves and the wind, than that which is afforded by the earth in which they lie torpid, in as much as meeting with no obstruction, the scorching blast sweeps rapidly over the hardened surface, without penetrating sufficiently deep, or at least with sufficient power to cause any injury or inconvenience to the animals buried some 6 or 8 inches deep, and protected by the branches of the dwarf shrubs beneath which they are found.

Of these shells, I shall take an early opportunity of forwarding specimens.

IX.—*Account of the Bearded Vulture of the Himálaya. By the same.*

I know not if this magnificent bird has yet been recognised by ornithologists as an inhabitant of the lofty mountain ranges of Thibet, and I have therefore little hesitation in recording the fact. A specimen sadly torn and mutilated by insects was a short time since pointed out to me as a Golden Eagle *(Aquila chrysäetos)*, from the hills, and having often before seen those noble birds both living and in museums, I paid no attention to it at the time.—On an after occasion, when the specimen was thrown away as useless, I happened accidentally to cast my eyes on it, and saw at a glance that it was not a Golden Eagle. A suspicion of the truth at the same time crossing my mind, from the circumstance of the black beard, which in this bird is so conspicuous, being still a very prominent feature, notwithstanding the ruinous state of the specimen, accordingly I took the skin home with me to examine at my leisure, and the following description is the result :

Gypeatus Barbatus ?

Length from the tip of the beak to the end of the tail 3 ft. 11 in. Beak, from the tip to the gape, 4 in. ; breadth from tip to tip of the expanded wings, 9 ft. 6 in. From the base of the upper mandible arises a black stripe of short hairs or bristles, passing over each eye, and turning round the back of the head, where it joins the stripe from the opposite side ; the crown of the head, which is much flattened, is covered with small whitish feathers ; but across these, running longitudinally from the base of the upper mandible to the black which passes round the back of the head, is a black stripe of narrow feathers. The chin, throat, back, sides, and forepart of the neck ; the breast, belly, vent, thighs, and under tail coverts, deep ferrugin-

ous; darkest on the chin, throat, and fore-neck, whiter on the vent and thighs.—A band or collar of dark brown feathers across the bottom of the knee, joining the black on the back, and thus forming a ring round the neck—back, scapulars, greater and lesser wing coverts, brownish black; the shafts of the feathers white, towards which the webs also grow lighter—upper-tail coverts and the quills of the wings and tail, greyish, or ashy black.—The first quill of the wing is $3\frac{1}{4}$ inches shorter than the second, and the third is the longest.—Tail feathers twelve in number, and gradually decreasing in length from the centre to the outermost ones, forming a well marked wedge.

Beak, feet, and claws faded to yellowish horn, the original colour not ascertainable.

The nostrils are entirely concealed beneath the jet-black bristles which stand forward over them, and which are a continuation of, or rather take their rise from, the point whence springs the black stripe which passes over the eyes.—At the angle of the lower mandible is a bunch of long black bristles, diverging and hanging down like a beard.—The beak is straight from the base to the end of the cere, which is very thin, and it then rises into an arch, and curves strongly to the point.—Legs short and feathered to the toes; outer and hinder claws, the largest: the inner one about half their size.—All moderately hooked, and much worn at the points.

In all other respects it appears to agree accurately with the description given of the Bearded Vulture in the "Gardens and Menagerie of the Zoological Society."

This specimen will be found to differ from the bird there figured in the following particulars:—The Bearded Vulture is stated to have "the upper part of the head of a dirty white," while in mine there is a black line across the white; this however might lead one to suspect the bird to be a young one, although the rest of the plumage does not appear to differ from that of the adult bird, showing no signs of the "white spots, or spots of a lighter shade, scattered over the back and wings," as alluded to in the work above-mentioned.

Again, it is said to have "the first quill-feather of the wing nearly equal to the second and third, which are the longest," &c.—In my bird, the first quill is $3\frac{1}{2}$ in. shorter than the second, which is a quarter of an inch shorter than the third; the third quill being consequently the longest, and the fourth nearly equal to the second.

This last character is perhaps a strong reason against supposing the two birds to be identical, and together with the different marking of the head and the ring on the neck, may go far to establish it as a

new species: but of this nothing positive can be said until some ornithologist on a visit to the hills may be fortunate enough to meet with the living bird, and have an opportunity of proving either the identity or distinctness of the species by observing the changes of plumage from youth to maturity—in the mean time, I have noted it down with a mark of doubt, as the Bearded Vulture of authors.

Nemuch, 21*st Feb.* 1834.

X.—*Proceedings of the Asiatic Society.*

Wednesday, the 5th November, 1834.

Dr. J. Tytler, Senior Member, present, in the chair.

The Report of the Committee of Papers upon the list of names, proposed at the last meeting as honorary members of the Society, was submitted, when the following were balloted for and duly elected. Mekhara Meng, uncle to the king of Ava; Professor Heeren, M. Klaproth, and Prof. Rosen; Sir John Herschell, Prof. Buckland and Col. Sykes.

Read, letters from the Secretaries of the Royal Society, the Royal Asiatic Society, and the Geological Society, acknowledging the receipt of the 17th and 18th vols. of the Researches.

Also, from Professor Sedgwick, and from Mr. Aikin, Secretary of the Society of Arts, expressing thanks for the second part of the 18th vol. As. Res.

Read a letter from Col. J. Stuart, Deputy Secretary to Government, Military Department, intimating that the Honorable Court of Directors have, in a recent dispatch, informed the Government that the suggestion of the Society regarding a supply of tubes and apparatus for boring, will be attended to.

[We have since heard that they are on board the Sir Edward Paget.]

Read a letter from Captain R. Home, proposing on the part of his brother, Col. Home and himself, to deposit in the apartments of the Asiatic Society, the valuable collection of paintings, books, and casts, belonging to the gallery of the late R. Home, Esq, of Lucknow, in compliance with the wish expressed by their father previous to his demise, that they should be preserved in some public institution in Calcutta, where they might be properly attended to, and at all times open to public inspection.

Resolved, that the thanks of the Society be returned to Col. and Capt. Home for their most liberal offer, which they embrace with pleasure; and that suitable preparation be immediately made for their reception.

[The collection of paintings comprises the following valuable originals:—

Woman taken in adultery, by Dominichino, 6 ft. 2 in. by 4 ft.

Cleopatra, Guido, 4 ft. by 3 ft. 3 in.

Crowning of Mary de Medicis, Reubens, 5 ft. by 3 ft.

Infant Jesus, ditto, 4 ft. by 3 ft.

Sir William Jones, as a boy, Sir Joshua Reynolds.

Cupid asleep on a Cloud, Sir Joshua Reynolds.

Prodigal Son, Bassan, 5 ft. by 3 ft. 8 in.

Cathedral at Antwerp, Steinwich the Elder, 3 ft. 9 in. by 2 ft. 10 in.

Triumphal Arch, (Titus',) unknown, 5 ft. by 3 ft. 9 in.

Ghat at Benares, Daniel, 5 ft. by 3 ft. 4 in.

2 Views in Venice, Caualetti.

2 Views in Wales, Davies.

Head of an Old Man, on pannel, unknown.

And the following Portraits:—Warren Hastings, Lord Cornwallis, Lord Wellesley, Lord Minto. Sir G. H. Barlow, Sir E. Paget, Sir W. Jones, Dr. Fleming, Horace H. Wilson, Dr. Hare, the Nawab of Dacca, Col. Duff, Gen. Jones, and Dr. Laird.

They are now on their way down by water. The public are not generally aware that the Museum and Library of the Asiatic Society are at all times open to visitors, between the hours of 6 A. M. and 4 P. M. None but members of course have the power of taking books out of the rooms.]

Library.

The following donations to the library were announced:

Lt. A. Conolly's Overland Journey to India,—*presented by F. Macnaghten, Esq. on the part of the author.*

Dr. Baikie's Observations on the Neilgherry Hills,—*by W. H. Smoult, Esq., the editor.*

M. Eugene Burnouf's Observations sur la partie de la Grammaire comparative de M. F. Bopp, qui se rapporte à la langue Zende,—*by the author.*

Rev. W. D. Conybeare's Report on the Progress, Actual State, and Ulterior Prospects of Geological Science,—*by the author.*

Counsellor Joseph Von Hammer's German Translation of the Turkish Poet Fazli's *Gul o Bulbul*, with the original text in the Nashki character,—*by the translator.*

Annals of Literature of Vienna, Nos. 61, 62, 63, 64,—*by the same.*

C. T. Beke's Origines Biblicæ, or Researches in Primeval History,—*by the author.*

Archæologia, the 25th vol. of the Transactions of the Antiquarian Society,—*by the Society.*

Transactions of the Royal Society of Edinburgh, vol. xii. pt. 2nd, and Nos. 1 and 2, of its Proceedings,—*by the Society.*

Anniversary Address for 1834, by G. B. Greenough, President, and Proceedings of the Geological Society of London, Nos. 32, 33, 34, and 35, with Index of vol. I.—*by the Society.*

Journal Asiatique, No. 76,—*by the As. Soc. of Paris.*

The Indian Journal of Medical Science,—*by the editors.*

Meteorological Register for August and September,—*by the Surveyor General.*

Ditto, kept at Cawnpur, to the end of September, 1834,—*by Col. Pollock.*

The following books were received from the London Booksellers:—

Lardner's Cabinet Cyclopedia, Arithmetic, Manufacture in Metals, and Middle Ages, 3rd vol.

Literary Communications.

The Secretary reported receipt of a continuation of the late Mr. George Trebeck's manuscript journals, (Cashmír to Cabul, May—June, 1823,) presented by his brother Mr. Charles Trebeck, who had at length recovered it through Mr. Fraser of Delhi. It is believed that other portions of his and of Moorcroft's papers still remain up the country. *Resolved*, that the present portion be despatched forthwith to Professor Wilson, who is now engaged in publishing the former part of Moorcroft's Journals, on the part of the Society.

A letter was read from the Baron Von Hammer, dated Vienna, 31st March, 1834, presenting a manuscript analysis and translation in part of a rare and valuable Arabic work entitled 'Mohit,' by *Kiatib Rúmí*.

"After my return from Italy, where I found at Naples, in the year 1825, in the library of the Museo Borbonico, Kiatib Rúmí's *Mohít*, which contains a treatise on navigation in general, and that of the Indian seas in particular, I redoubled my commissions at Constantinople for this exceedingly rare manuscript, and was last year so fortunate as to purchase a copy of it.

"I hasten to transmit some extracts to the Asiatic Society, which if they are thought interesting enough, I shall have great pleasure in continuing."

An account of the overland journeys of the same Arabic author, by M. Von Hammer, appeared in the first part of the Bombay As. Soc. Transactions, in which an allusion is made to the present work. (See also Orient. Mag. 1. 233.)

A letter was read from W. H. Wathen, Esq. Secretary to the Bombay Government, transmitting by order of the Right Honorable the Governor in Council, a copy of an inscription found on the Arabian coast at a place called Hasan Ghorab, near Aden, together with a graphic description of the ancient fort, drawn up by Lieutenant Wellsted of the Indian Navy.

[This paper will have an early place in the Journal.]

Read a letter from the Rev. J. Stevenson, on the subject of the Inscriptions engraved on the excavated temple at *Karli* near *Púná*, which he has succeeded in decyphering with the assistance of the alphabet of the Allahabad monument published in the Journal As. Soc.

[This paper is inserted in the present number.]

The continuation of Lieut. Foley's description of Ramree Island was received and read.

Extracts of a private letter to the Secretary, from Captain C. M. Wade, Political Agent at Ludiána, were read, enclosing a Memoir in French, by M. Court, an officer in the service of Mahárájá Ranjít Singh, detailing his operations on several other Topes in the neighbourhood of that originally opened by General Ventura; one of them affording highly interesting results.

Captain Wade also forwarded a letter from General Ventura himself, who, in continuation of his former important researches, has since collected upwards of five hundred ancient coins, which he has entrusted to M. Allard, for the Museum of Paris, politely offering their inspection and examination to the members of the Asiatic Society, as long as M. Allard may remain in the metropolis.

"Dans la mois de Janvier dernier me trouvant campé entre l'Hidaspe et l'Indus, je me disposais à faire des nouvelles recherches et visiter moimême plusieurs ruines que je savais exister dans ces contreés lorsqu'un coup de paralysie vint m'arreter dans mes dispositions: alors j'envoyais mes gens à la decouverte et je fus assez heureux de les voir retourner avec une collectiou de belles medailles que je viens de remettre au cher M. WADE qui vous les fera parvenir, je le pense, par les soins de M. AILARD qui se rend à Calcutta incessamment: mais, n'ayant pas é'é sur les lieux moimême, je ne puis accompagner ces medailles que de quelques notes des endroits où elles ont été trouvées."

Physical.

Fossil shells, part of the foot of a tortoise, and various minerals, (including coal,) from Ramree, were received from Lieutenant FOLEY.

A note to Lieutenant ARCHBOLD respecting the shipment of the mummy from Mocha was communicated. The *Malak-ul Bahr* was to have brought it, but the crew refused to keep it on board after it had been shipped.

A letter was read from Captain CAUTLEY, dated Delhi, the 14th October, descriptive of the collection of fossil bones made by Serjeant DEAN, from the Jumna, and stating, that he was deterred from making further presentations to the Society's museum, on account of the expence of conveyance from so great a distance. In reference to this subject, it was moved by the Secretary, seconded by Dr. J. TYTLER, and *Resolved unanimously,*

"That Serjeant DEAN be remunerated for the expences incurred by him for the transmission of fossils from the Upper Provinces to Calcutta, and that the Society will be happy to be at the further expence of carriage of any other fossils with which Serjeant DEAN may have it in contemplation to favor the Museum, from the same deposit."

Captain CAUTLEY's letter gives the following additional particulars of the fossil bone deposit in the *Sewálik* hills: and of the subterranean town at *Behat.*

"This is a favorable opportunity of reporting progress on the fossil discoveries of the lower hills (Sewálik), which are going on even more flourishingly than I could have expected, considering that the only means of continuing the search during the rainy months were in carting fragments of the rock from the deposit to my house. The fossils are even now not only numerous, but rich in the remains of a great vareity of species: Saurian and Chelonian, both Emys and Tryonin, are most abundant: of the Saurian, the teeth of two varieties correspond very closely with the existing Alligator (or magar of the natives), and the Gharial (or *Gavial* of naturalists): there appears to be a third variety of teeth of this order, as well as the jaw-bones of two of a smaller claw of lacertine animals, one specimen of which is exceedingly interesting, consisting of the lower half jaw, with one cheek-tooth, well fossilized. Of Mammalia, three families are very distinct, Solipeda, Ruminantia, and Rodentia, the former in one solitary specimen of an incisor of some animal of the horse species, the second of a variety of teeth of deer, the third of rats; besides these, there are a great variety of teeth, which from want of experience and want of books of reference, I am unable to recognize. Some bones also, about which, for the reasons above mentioned, I can say nothing: two specimens of fisbes' vertebræ, and some undoubted teeth of Squalus, or some voracious species,

will give some idea of the present state of my cabinet. Laying aside direct geological reasons, which may hereafter be best referred to, the great variety of remains already found in so short a period makes this discovery valuable. A farther search on the line of mountains, of which the Sewálik may be considered the centre, will, I have no doubt, establish the fact of the existence of these remains on the whole line. Lieutenant Durand, of the Engineers, on a late visit to Nahun, was fortunate enough to meet with the stratum of marle or clay conglomerate on the north face of the mountain upon which the town of Nahun stands; the remains therein discovered, in my opinion, identify it completely with the Sewálik stratum, the position of both being similar and in juxtaposition with the calcareous sandstone. The fossils in the Nahun deposit, which Lieutenant Durand has introduced us to, consist of tortoise, saurian, mammalia, and fish, exactly of a similar description to those found at the Kalowála Pass, the enamel equally perfect, and the more solid masses of bone as highly impregnated with (hydrate of) iron. Lieutenant Durand's discovery is of particular interest, from its having at once established the formation of the Nahun connecting link, as at this point the low line of mountains skirting the Dhera and Karda Dhúns, impinge upon the great Himálayan chain. Since the discovery of these fossils, I have visited the spot, and am satisfied of the identity of this formation with that of the Sewálik, and have every reason to imagine that an active search will not only shew that a similar deposit exists on the Pinjore line of lower mountains terminating at Rúpur; but that equal success may be expected on the left of the Ganges: as this is a mere notice of the progress of these interesting discoveries, it would be out of place to enter upon the matter geologically.—There is a tradition existing, of the remains of giants having been discovered in the neighbourhood of the Pinjore valley, near a village named Samrota, the said giants having been those destroyed by the redoubtable Ramchandra. I have lately seen a tooth and a fragment of a tusk in the possession of Lieutenant W. E. Baker of the Engineers, which were presented to him by the Nahun Rájá, as the remains of giants, and found near the above village: Lieutenant Baker will take an early opportunity of sending you drawings of both these fossils, the first a very perfect tooth of an elephant, with the enamel of the flexures in the crown beautifully retained, the other the fragment of a small tusk, I imagine of an elephant also; both of these specimens are completely silicified: and from the appearance of the matrix, small fragments of which are visible in the interstices of the tooth, it would appear to be sandstone, or indurated sand: to those people who have time and leisure to visit Sumrota and the Pinjore valley, what a fine field is here opened out for interesting discoveries of the newer organic remains. I think that the circumstance of the existence of a deposite of this sort, either in or near the Pinjore valley, is mentioned by Dow in his History, from Ferishta; the bones having been found in digging a canal, or in the construction of some work, where excavation was necessary*.

* The passage in Dow's Feristha is quoted in the appendix to Professor Buckland's note on the fossil bones from Ava. As it is short, we copy it, in hopes of its leading to further inquiries for fossils in the Pinjore valley.

"On the King's return to the capital, in the month of Rajeb, 762, (May, 1360,) he heard that in the vicinity of Perwar, was a hill, out of which issued a stream of water

"Some days hence I will despatch to the Museum some more relics from Behat. Circumstances have prevented a fair opportunity of continuing the search, but there are a few more interesting coins, one of them bearing a distinct inscription, some rings, and a small idol made of either sandstone or composition: a great quantity of small irregular lumps of iron and slag have been found, with some more arrowheads."

Extracts of a letter from Capt. EDWARD SMITH, Engineers, were read, explaining that he had been induced to postpone furnishing the list of the fossils from the Jumna, presented by him to the Society in December last, by having afterwards received further remains of the same kind in great number and variety, which he is now preparing to dispatch.

"You are I believe aware of the existence of fossils in the Jumna, in a greater abundance than was at first supposed; but I have, notwithstanding my own expectations to that effect, been surprised at the quantities that the last four or five months have produced, and the length of course of the river through which they are found. In the observations that have been made of the situations, only beds in which they have been lodged, there may be obtained some conclusions that the former less exact acquaintance with the place of deposit gave no evidence of. Some of these specimens are of such size that I shall have difficulty in finding an early conveyance for them, which however, I will look out for. I scarcely anticipated being able to add so largely to those already in your possession; there having this year been no works on the river in parts containing fossils. It was in descending the river, in March last, that searching on the banks I discovered those which are in preparation for you."

that emptied itself into the Setlej river, which the people called the Sursetti, and that beyond it was a smaller stream denominated Selima.

"It was stated, that if an eminence which intervened between these streams were cut through, the waters of the Sursetti, falling into the smaller stream, would flow on to Súnam, passing by Serhind and Mausurpur, and that the supply of water would be perennial.

"On this information, the King (FEROZ) proceeded in that direction; and causing fifty thousand labourers to be collected, he employed them in cutting through the mound or hill, so as to form a junction of the two streams. In this mound were found the bones of elephants and men. The bones of the human forearm measured 3 gez, or 5 feet 2 inches, in length. Some of the bones were petrified, others resembled bone."

We strongly recommend the canal thus cut by FEROZ SHAH, five centuries ago, to a careful elucidation by Captain CAUTLEY. If it still exist, it must afford one of the best situations for studying the direction and nature of the gravel deposits of the lower range, and of their fossil contents. It is seldom that a geologist can command the aid of fifty thousand men to open a section of the Himalâyau strata to his view.

The fossil deposits of the north-east extremity of the great range are also well deserving of further examination. It was among the mutilated fragments of bone procured by Mr. COLEBROOKE in Kooch-behar, on the banks of the Brahmaputra river, that Mr. PENTLAND discovered traces of the Anthracotherium of CUVIER. It is most probable that the declivities of the lower range in its entire length will afford very numerous tertiary fossil deposits, when it comes to be explored.—ED.

XI.—*Illustrations of the Botany and other branches of the Natural History of the Himálayan Mountains and of the Flora of Kashmir; Part* II. *By* J. Forbes Royle, *Esq. F. L. S. and G. S. M. R. A. S. &c.*

Mr. Royle's Second Part maintains its claim to the praise that the scientific journals of Europe had pronounced upon his first. The introduction continues his general observations on the geographical and geological structure of the great continent of India, drawing, for those portions, which he has not had an opportunity of visiting, his materials from Sykes, Calder, Hodgson, Gerard, &c. and from Humboldt for the systems of mountains in central Asia. The first plate also exhibits two geological sections of the Himálayan range, and a sketch of the rocks from Shergáti to Rogonáthpur; the former we shall hereafter transfer to our pages when the introductory remarks, which break off at the 12th page, are completed: the latter has been already given in Mr. Everest's notes of a journey to Ghazipúr, (Gleanings, iii. 129.)

The purely botanical portion of the work commences with the *Ranunculaceæ*, of which nearly a hundred species have been discovered in the Himálayas. Several of them are identical with those of other countries. The Himálayan genera, with one exception, are exactly those enumerated by Ledebour as inhabitants of the Altai mountains: also, with exception of *Helleborus* and *Nigella*, which do not extend either eastward to the Altai or southward to the Himálaya, the same genera are enumerated by Meyer and Bieberstein as indigenous to the ranges of Taurus and Caucasus.

Our author's observations on the application of the plants of this family in the Materia Medica of India are so valuable, that we need offer no apology for extracting them entire. We would willingly follow them up by his remarks on the other natural families *Dilleniaceæ*, *Magnoliaceæ*, *Anonaceæ*, *Menispermaceæ*, *Berberidæ*, &c. but neither our limits, nor justice to the author would permit so extensive a robbery. No one who would be acquainted either with the ornamental, the cultural, or the medical qualities of the Indian Flora, can dispense with the possession of Dr. Royle's highly valuable labours—labours which he is now ushering to the world at great expense to himself and without the same extent of patronage with which the Honorable Company were wont in days of yore to encourage such meritorious works in their servants.

"The *Ranunculaceæ* form a very natural family, not only with respect to structure and geographical distribution, but also in possessing the same sensible properties and modes of action on the human frame. This is owing to their containing in all parts an acrid principle, which Krapf ascertained to be neither acid nor alkaline, but of so volatile a nature, that in most cases simple drying in the air, or infusion, or decoction in water, is sufficient to destroy it; that its activity is increased by acids, sugar, honey, wine, and spirits, and is only effectually destroyed by water and vegetable acids. (*Fée, Cours. d'Hist. Nat. Pharm.* vol. i. p. 373.) Two vegetable alkalies, *Delpia* and *Aconitia*, the latter little known, are produced by the plants of this family; if the acrid principle be always of the volatile nature that it is represented, the powerful effects attendant on the administration of the root of *Aconitum ferox* even after it had been preserved ten years must be ascribed to the presence of some principle of a more permanent nature. According apparently to the proportion of the acrid principle to the rest of the vegetable substance, or perhaps owing to the peculiar nature of the acrid principle

in each species, it is found that they act either on the system generally, or in different degrees on particular organs. Thus several species of *Ranunculus* are used as rubefacients and vesicatories; while the roots of *Zanthorhiza*, *Coptis*, and *Hydrastis*, as tonics; and those of *Thalictrum majus* as a substitute for rhubarb. *Hellebore* has long been known as a powerful cathartic, and *Aconite* as a no less powerful narcotic and poison; while some from the destructibleness of their noxious property by water have been used as food. The Mahomedan physicians in India having derived their knowledge of drugs chiefly from Arabian authors, who translated from the Greek, it is not surprising to find such articles as *Hellebore*, *Pæony*, *Lycoctonum*, and *Stavesacre*, all of which as well as others might be grown in the Himálayas, prescribed in every part of India, though the druggists, calculating upon the ignorance of both practitioners and patients respecting the true drug, generally substitute some which they consider an equivalent. Yet it is interesting to observe, that independent observation has introduced into Indian practice several drugs from this family, to which the same properties are ascribed as in Europe. Thus *Ranunculus sceleratus* is used as a vesicatory. The roots of *Thalictrum foliosum* as a bitter in the cure of fevers—those of *Aconitum heterophyllum* as a tonic, and of *Aconitum ferox*, though a poison, as a narcotic in rheumatism. *Nigella sativa* is alone cultivated in India, as in most eastern countries, and continues in the present day, as in the most ancient times, to be used both as a condiment and a medicine.

The celebrated Indian poison called *Bish* or *Bikh*, being referred by all authorities to *Ranunculaceæ*, requires to be noticed, though it would not be easy, even in the present state of confusion of Indian Materia Medica, to find an article of which it is more difficult to give a satisfactory account, and of which, at the same time, it is so necessary that we should have a clear idea. The subject to be entered into, with the detail which it requires, would claim a much greater space than can be allotted to it here: little more therefore can be done than to state the little that is known, and to urge observers, who may be favourably situated, to prosecute the inquiry.

Dr. Buchanan first acquainted the European world with the existence of four kinds of *Bikh*. 1. *Singya Bikh*. 2. *Bish* or *Bikh*, the poison. 3. *Bikhma*, a powerful bitter. 4. *Nirbisi*; also without deleterious properties. The first Dr. B. referred to a species of *Smilax*; the author has had two species of *Convallaria*, called *meetha-doodhya*, and *mohura-doodhya*, represented to him as being of a poisonous nature. The three other kinds of *Bikh* Dr. B. refers to the genus *Caltha*, but for what reason it is difficult to discover, as the flower of the species he describes are without the characteristics of the genus; and the plant, he allows, differs much in habit from *Caltha palustris*. It may be supposed, therefore, that he had only an opportunity of examining the flowers in a young state, and it is known that when he published his description, he was without his specimens. These are now in the East-Indian Herbarium, and have been all referred by Dr. Wallich to the genus *Aconitum*. The specimens of *Caltha? Nirbisia* and *C.? Codoa* of Dr. Buchanan, appear to be Dr. Wallich's *Aconitum ferox*, while those of *C.? Bishma*, his *Aconitum palmatum*, all evidently in a young state, and without flowers or fructification. That the virulent poison, emphatically called *Bish*, *i. e.* the poison, is the root of *Aconitum ferox*, admits, I think, of no doubt. The root is brought down to the plains of India from the mountains where

this plant is indigenous; that it was produced by it was first learnt by Dr. Wallich in Nepal; the fact was confirmed by Dr. Govan in Sirmore, and the information communicated to the author on the same mountains was, that *Bikh* is the name applied to *Aconitum ferox* and *Meetha tellia* to the root, which, though a violent poison, is occasionally used in medicine. It may further be stated, that the specimens of *Aeonitum ferox* in the author's Herbarium, have the fusiform roots attached side by side, black and wrinkled externally, and of a brownish colour internally; they impress upon the tongue and fauces a peculiar burning sensation, and increase the flow of saliva, as is described to be the case with the *Bikh*. They moreover exactly resemble the specimens brought in the Indian bazars, of *Meetha tellia*, in the author's collection of Materia Medica.

Both Drs. Buchanan and Wallich have mentioned the uncertainty and confusion existing in the names of the several articles of the Indian Materia Medica. This is no doubt true, and it therefore becomes more necessary to elucidate the subject, when such powerful drugs are sold and administered as remedies for disease. Considerable assistance will be derived in this labour, if, when consulting native works on the subject, we at the same time procure as many as possible of the drugs which are described. Without this no satisfactory progress can be made, as we have no means of ascertaining when the same drug is given in different parts of the country, under different names, nor when, which is sometimes the case, different articles are given under the same name.

Dr. Buchanan (*Brewst. Journal*, i. p. 250) gives *Bish*, *Bikh*, and *Kodoya bish* or *bikh*, as the synonymes: to these *Meetha* ought to be added, instead of being referred to *bikkma*. Professor H. Wilson (*Cal. Med. Trans.* vol. ii. p. 280) referring to this article, says, that *Bish*, *Bikh*, or *Vish*, means poison simply, and that it has several Sanscrit synonymes, as *Amritam*, *Vatsanabhu*, *Visham*, *&c.* Dr. Carey, in his Bengalee Dictionary, refers *Bish* to *Aconitum ferox*, and quotes as synonymes with *Vatzanabhu*, *Mitha*, or *Mitha zuher* (sweet poison). Dr. W. Hunter (*Cal. Med. Trans.* vol. ii. p. 410) has *Meetha zuhur*, *Meetha bikh*, and simply *Mitha* as synonymes. Dr. Wallich (*Plantæ Asiat. Rar.* vol. i. p. 41) mentions that Dr. Govan found the root called *Meetha-doodya* and *Meetha telya*, and gives as synonymes, *Visha*, *i. e. Venenum, et Ati visha, summum venenum;* Hindee, *Vish* or *Bikh;* Newar, *Bikh* and *Bikma*. In the *Mukhzun-ool-Adwieh*, probably the best Persian work on Materia Medica in use in India, several kinds of *Bish* are enumerated; as—1. *Seengheea*, so called from its resemblance to the horn of a Deer. 2. *Buchnag*, like *judwar*. 4. *Teezuk*. 5. *Kuroon-ool-soombul*. 6. *Buhrasoorut*. 7. *Burhmunee*. 8. *Muhoodah*. 9. *Huldeh*. 10. *Kala koot*. 11. *Sutwa*. 12. *Tellia*. But as it is doubtful whether these are varieties or species, or whether more than those already mentioned, can be referred to the genus *Aconitum*, they are only enumerated as subjects for further inquiry. In the *Taleef-Shereef*, an Indian work on Materia Medica, lately translated by Mr. Playfair, *Singia* and *Bechnaek* are given as two names of a most deadly poisonous root from Nepal, no doubt the Aconite.

In all the native works, the *Bikh* is represented as being a deadly poison, even in the smallest doses. The Hindoo works quoted by Dr. Hunter describe it as being at first sweetish (hence the affix *meetha*, sweet), and then followed by a roughness on the tongue, or as it is expressed in one work, "seizing the throat."

Dr. BUCHANAN has informed us, that it is equally fatal when taken into the stomach, and when applied to wounds; hence used for poisoning arrows and killing wild animals. The futility of the Gorkhas attempting to poison the springs of water was shown in the last campaign, and Dr. GOVAN has proved the improbability of deleterious exhalations from this plant being the cause of the unpleasant sensations experienced at great elevations, inasmuch as it is only found much below where these are experienced. But as it is a root of such virulent powers, it has no doubt been frequently employed as a poison, and its sale was therefore prohibited by the native powers in India. Notwithstanding this, the Hindoo physicians, noted for the employment of powerful drugs, such as arsenic, nux vomica, and croton, do not hesitate to employ this also in medicine. In the *Taleef-Shereef* it is directed never to be given alone; but mixed with several other drugs, it is recommended in a variety of diseases, as cholera, intermittent fever, rheumatism, tooth-ache, and bites of snakes. It is also used as an external application in rheumatism in the north-western provinces. Mr. PEREIRA's experiments have shown that this root, either in the form of powder, watery extract, or spirituous extract, is a most virulent poison: but of these forms the last is by far the most powerful. "The "effects were tried by introducing this extract into the jugular vein, by placing it "in the cavity of the peritoneum, by applying it to the cellular tissue of the back, "and by introducing it into the stomach. In all these cases, except the last, the "effects were very similar; namely, difficulty of breathing, weakness, and subse-"quently paralysis, which generally commenced in the posterior extremities, ver-"tigoes, convulsions, dilatation of the pupil, and death, apparently from asphy-"xia." *(v. Watl. Pt. Asiat. Rar. loc. cit.)*

With respect to the *Bikhma*, or the second kind of *Bish*, the difficulties are greater, as the specimens of *Cattha ? Bikhma*, which Dr. BUCHANAN was informed produced the febrifuge root, belong to Dr. WALLICH's *Aconitum patmatum*, Cat. No. 4723; this may therefore produce a root possessed of the properties ascribed to the *Bikhma* by Dr. BUCHANAN's informants. Though we have no further information respecting it than its name, properties, and the short description of *Radix tuberosa* to guide us, it is interesting to endeavour if it can be traced in other parts of India, though names, especially provincial ones, we have seen vary in different districts, and the properties ascribed to a drug is rather an uncertain guide in the present state of the Indian Materia Medica; but it appears to be more than an accidental coincidence, that the author, in his inquiries, has met with a *tuberous root* produced by a species of *Aconite*, which is extensively used in India as a tonic medicine. In the native works on Materia Medica, as well as in the common Persian and Hindoostanee and English Dictionaries, *Atees* is described as being the root of an Indian plant used in medicine. This the author learnt was the produce of the Himálayas: he therefore sent to one of the commercial entrepots situated at the foot of the hills, and procured some of the root, making inquiries respecting the part of the mountains whence it was procured. The plant-collectors in their next excursions were directed to bring the plant, with the root attached to it, as the only evidence which would be admitted as satisfactory. The first specimens thus procured are represented in Plate 13, and the root *Atees* having been thus ascertained to be the produce of a new species of Aconite, it was named *Aconitum atees* (*Journ. Asiat. Soc.* vol i. p. 459), but which has since been ascertained to be the *Aconitum heterophyllum* of Dr. WALLICH. The roots obtained in different parts

of the country resemble one another, as well as those attached to the plant. They are about an inch in length, of an oblong oval-pointed form, light greyish colour externally, white in the inside, and of a pure bitter taste. That its substance is not so injurious as the *Bish*, I conclude from its being attacked by insects, while the other remains sound and untouched. The natives describe it as being of two kinds, one black, the other white, and both as bitter, astringent, pungent, and heating, aiding digestion, useful as a tonic and aphrodisiac. By inquiries in Nepal it might easily be ascertained whether this has any resemblance to the *Bikhma* of Dr. Buchanan.

Respecting the third kind of *Bish*, *Nirbisi*, *Nirbishi*, or *Nirbikhi*, the uncertainties are also considerable; as we have only the information that it is a tuberous root without deleterious properties; while Dr. B.'s specimens of *Caltha? Nirbisia* are not to be distinguished from those of his *Caltha? Codoa*, which have been shown to be those of *Aconitum ferox* in a young state. It is evident, therefore, that the people employed did not take the necessary precautious, and, perhaps, brought the leaves of the latter plant, because they thought it was like the true one, and it may therefore be supposed to be one of the *Ranunculaceæ*, particularly as the author, in the mountains of Sirmore and Gurhwal, found the name *Nirbisia* applied to *Delphinium pauciflorum*: and the roots brought down from these mountains with that name have the closest resemblance to the roots of some species of this genus, though he did not succeed in tracing it to the particular one; but that which is reckoned the best kind of *Nirbisi* in the Indian bazars is of a very different nature, and brought down from Bissehur and from Umritseer, the commercial capital of Lahore. This kind is fusiform, somewhat flattened and wrinkled, of a black colour externally, and in some respects resembling the *Bikh* itself; when cut, the substance is found to be compact, and of a brownish colour, with a slight degree of bitterness and acrimony.

The name *Nirbisi*, with its Persian and Arabic synonymes, *judwar* and *zudwar*, has been already applied by Mr. Colebrooke to the roots of *Curcuma Zedoaria*, because they agree pretty well with the round zedoary (*zedoaria rotunda*) of the shops; but that distinguished scholar, with a caution dictated by his extensive knowledge of the subject, observes, that if the drug be not the true zedoary, the synonymes must be transferred to some other plant. The term *Nirbisi*, as observed by Mr. Colebrooke, implies that the drug is used as an antidote to poison, being composed of the privative preposition *nir* and *bis*, poison; and in the *Mukhzun-ool Adwieh*, it is further explained, as repelling from and purifying the body from deadly poisons. It may therefore be considered as a medicine of considerable importance in Eastern countries, and that it is not only so at present, but has been reckoned such from very ancient records, will appear from the following quotations. The Arabic synonyme *Zudwar*, leads us at once to the accounts of the *Zedoaria* of old authors and the *Geiduar* of Avicenna. Thus, Mathiolus (*Commentaries on Dioscorides*, lib. ii. c. 154), tells us, "Zedoaria (ut cap. clxxii. testis est Serapio) convehitur e Sinarum regione ultra extremas Indiæ oras;" adding, after giving the medical properties, "et in antidotis additur. Ideoque dixit Avicenna nihil esse ea præstantius ad cbibitum Napellum." Garcias ab Orta, who was for so many years one of the physicians at Goa, writes: "Quod nos hic Zedoariam appellamus, *Avicennæ*, lib. ii. cap. 734, *Geiduar* dicitur; aliud no-

men ignoro, quia nascitur regionibus Sinensium provinciæ vicinis. Magno vero emitur *Geidwar;* nec facile invenias, nisi apud circumforaneos quosdam et circulatores, quos Indi *jogues*, Mauretani *Calandares* appellent, hominum genus quod peregrinationibus et stipem amendicando vitam sustentat. Ab his enim et reges et magnates Geidnar emunt." "Utile est autem istud Geiduar ad plurima, sed præsertim adversus venena, et virulentorum animalium ictus morsusque." Clusius, at p. 378 of the same work, "Exoticorum libri decem," having obtained some specimens, "Gedwar veri nomine inscriptas," gives a figure, and compares them with the roots of Anthora, which was at one time thought to be the Zedoary; they resemble a good deal those of ateeo, as represented in pl. 13. The Persian authors, after giving the synonymes, mention that there are five kinds of *Judwar*. The best, called *Khutai*, or Chinese, procured from the mountains of that country. The two next kinds are the produce of the mountains of Tibet, of Nepal, of Morung, and Rungpore; the fourth kind is from the hills of the Dukhun; and the fifth, called *Antulah*, is the produce of Andaloosee, or Spain. A long account follows of the properties and uses of *Judwar*, of which it is needless to adduce more than that it is considered a powerful antidote to poison, particularly of the *bish;* more so, indeed, than the *tiryak farook*, the ingredients of which are given by Prosper Alpinus De Medicin. Ægypt. lib. iv. c. 9. It is therefore probable, that the *Nirbivi* is the true *Zedoary* or *Geiduar* of Avicenna, whatever may be the plant which produces it; that it is not likely to have been what is now so called, the produce of a species of *Curcuma*, is evident from the difficulty which Garcias an Orta had in procuring it even in India. Further, if the descriptions in the Persian works on Materia Medica be compared with those of the old Arabian authors, they will be found to refer to the same article, of which in India the name is *Nirbisi*. It may therefore be recommended as an interesting subject of inquiry for travellers in the Himalayas from Silhet to Cashmere, to ascertain the plant or plants which furnish the different kinds of *Nirbisi*, *Judwar*, *Zudwar*, or *Antuleh*. *Cissampelos convolvulacea* is called *dukhnirbisee* in the N. W. provinces."

Since selecting the above extract for press, the Third Part of Dr. Royle's Illustrations has reached India. It contains plates of fourteen new plants;—two zoological; and one plate of the *fossil plants of the Burdwan coal formation**. Under the family *malvaceæ*, we find a luminous and highly useful account of the cotton plant and its cultivation in various parts of the world, which we regret having no space to notice further at present. The author has also supplied a desideratum in botany by his monographical epitome of the gossypia, which he distinguishes into eight species.

Lieut. Arthur Conolly's Overland Journey to India, and Lieut. A. Burnes' Voyage up the Indus and subsequent Mission to Kábul and Bokhárá, have both appeared among the recent arrivals from England. As the Gleanings in Science have already given an epitome of the former journey, and the Journal As. Soc. of the latter, we need say no more than that, both works do credit to our enterprising travellers.

* What has become of the valuable series of drawings of these fossils prepared from the specimens in the Society's museum by Dr. Falconer three years ago?—Ed.

XII.—Col. Sykes' *Catalogue of Birds of the Insessorial Order in the Dukhun.*

[Continued from page 423.]

Fam. *Merulidæ*, Vigors.—Genus *Oriolus*, Auct.

58. *Oriolus Galbula*, Linn. *Golden Oriole*, Lath. *Mango Bird* of Dukhun.
Very abundant in Dukhun just before the rains. It is called *Pawseh* by the Mahrattas, from being the precursor of the monsoon. It is a quarrelsome bird. *Irides*, rich lake.

59. *Oriolus melanocephalus*, Linn. *Black-headed Oriole*, Lath.
Rare. Seen by Colonel Sykes only in the immediate neighbourhood of the Ghauts. Found also in Africa.

60. Oriolus Kundoo. *Or. corpore suprà flavo-viridi; uropygio, crisso, pogoniis internis rectricum ad apices, abdominisque lateribus nitidè flavis; alis olivaceo-brunneis; corpore subtùs sordidè albo, brunneo striato; rostro nigro.*
Irides, rufo-brunneæ. Longitudo *Or. Galbulæ.*
Both sexes alike. Size of *golden Oriole*, and much resembling the female of that bird; but the bill is always black, and the *irides* reddish-brown instead of lake.

Genus *Turdus*, Auct.

61. *Turdus macrourus*, Gmel. *Long-tailed Thrush*, Lath.
Rare. Found in the dense woods of the Ghauts.

62. *Turdus Saularis. Gracula Saularis*, Linn. *Pastor Saularis*, Temm. *Little Indian Pie*, Edw., pl. 181.

63. *Turdus cyanolus*, Jardine and Selby, pl. 46.
This bird has the tongue of a *Pastor. Irides*, intense red brown. Stony fruit and *Cicadæ* found in the stomach. Has the naked spot behind the eyes, but the bird has not the air of a *Pastor*. Inhabits the Ghauts.

Genus *Petrocincla*, Vigors.

64. Petrocincla Pandoo. *Petr. brunnescenti-cyanea; pteromatibus, remigibus rectricibusque fuscis.*
Irides, fuseæ. Statura minor quàm *Turd. cyanei.*
This bird differs from the *solitary Thrush* of Europe *(Turd. cyaneus*, Linn.) in its smaller size, slighter form, brighter cœrulean tint, want of orange eye-lids, and white tips to the feathers. Found only in the dense woods of the Ghauts. Flight, low and rapid. It appears to correspond with var. A. of Dr. Latham's *solitary Thrush*, vol. 5, p. 47.

65. Petrocincla Maal. *Petr. suprà griseo-brunnea, subtùs rufescenti-alba, plumi brunneo marginatis; crisso rufescenti, fusco-brunneo fasciato.*
Statura præcedentis.
This bird corresponds as closely as possible with what is stated to be the female of the *Turd. cyaneus*, and may by analogy be supposed to be the female of *Petrocincla Pandoo;* but it inhabits only the prickly milk-bushes *(Euphorbia tortilis* and *pentagona)* of the rocky plains of the Dukhun. Colonel Sykes never saw it in the Ghauts, nor in company with *Petr. Pandoo.*

66. *Petrocincla cinclorhyncha*, Vigors, Proceed. Zool. Soc. 1. p. 172. Figured in Gould's Century of Himalayan Birds.

Genus *Timalia*, Horsf.

67. Timalia Malcolmi. *Tim. pallidè griseescenti-brunnea, uropygio pallidiori, remigibus rectricibusque mediis saturatioribus, his fusco absoletè fasciatis; subtùs albescens, leviter rosaceo tincta; frontis plumis subcyaneis, in medio albo striatis.*
Irides, flavo-aurantiæ. *Rostrum* brunneum, mandibulâ inferiori ad basin flaveseenti. Longitudo *corporis* 11½ unc., *caudæ* 5½.
Kokuttee of the Mahrattas. Congregate in flocks of ten or a dozen; fly low, slowly, and with difficulty: never cease chattering, and all at the same time. Food, grasshoppers and grain. Colonel Sykes has dedicated this species to Sir John Malcolm, G.C.B., who zealously aided his researches in India.

68. Timalia Somervillei. *Tim. rufescenti-brunnea; abdomine, crisso, dorso imo caudâque dilutè rufis, hâc saturatiori obsoletè fasciatâ; remigibus brunneis; gutturis pectorisque plumis in medio subcyaneo notatis.*
Rostrum pedesque flavi. Longitudo *corporis* 9½, *caudæ* 4½.
Irides, pallidè flavæ.
A size less than *Tim. Malcolmi*, but shorter. *Irides*, bright yellow: same habits as the preceding, but found in the Ghauts only; the latter on the plains. Colonel Sykes has dedicated this bird to Dr. William Somerville, F.R.S. in testimony of his respect.

69. *Timalia Chataræa*, Frankl. *Gogoye Thrush*, Lath.?
Habits of the preceding, but about half the size of *Tim. Malcolmi. Irides*, red brown, legs, yellow.

Genus *Ixos*, Temm.

70. *Ixos jocosus*. *Lanius jocosus*, Linn. *Jocose Shrike*, Lath.
This is also the *Lanius Emeria* of SHAW. The male has a sweet note. Found only in the lofty woods of the Ghauts. *Irides*, fuscous. Lives on fruit: sexes alike.

71. *Ixos Cafer*. *Turdus Cafer*, Linn. *Cape Thrush*, Lath. *Le Courauge*, Le Vaill.
Inhabits gardens: destructive to fruit: without musical notes. Sexes alike.

72. *Ixos fulicatus*. *Motacilla fulicata*, Linn. *Sooty Warbler*, Lath. *Truquet noi des Phillipines*, Buff.
Sir J. ANSTRUTHER's variety. Lath., vol. 7, p. 112. Female, sooty-black, or brown-black.

Genus *Pomatorhinus*, Horsf.

73. POMATORHINUS HORSFIELDII. *Pom. olivaceo-brunneus; strigâ superciliari, collo in fronte, pectore, abdominique medio albis.*
Irides, fusco-sanguineæ. *Rostrum* flavum. *Pedes* fusci. Longitudo *corporis* 9.7 unc., *caudæ* 3.7.
Minute insects (Dipterous) found in the stomach. Birds remarkably shy, and only met with in the dense woods of the Ghauts. The note of the male is *hoot, whool, whoot*, uttered slowly: the female answers *hooe*. The tongue and habits of this bird are those of a *Thrush* or *Timalia*. I have dedicated this species to a gentleman to whom science is deeply indebted.

Fam. *Sylviadæ*, Leach.—Genus *Jora*, Horsf.

74. *Jora Tiphia*. *Motacilla Typhia*, Linn. Lath., vol. 7, p. 128, var. A. BROWN's Illust. pl. 36.
Dr. Horsefield's *Jora scapularis* appears to correspond with the female of *Jora Tiphia*. *Irides*, gray.

Genus *Sylvia*, Auct. *Warbler.*

75. *Sylvia montana*, Horsf. *Prinia montana*, Swains.
Differs from the type of *Prinia* in its rounded tail. *Irides* fuscous.

76. *Sylvia sylviella*, Lath. *Lesser White-throat.*
Differs from the European bird only in the reddish tint of the white below.

77. SILVIA RAMA. *Sylv. pallidè brunnea, subtùs albescens; caudâ obsoletè fasciatâ.*
Longitudo *corporis* 4.7, *caudæ* 1.9.
Sexes alike. A size smaller than *Sylv. montana*, and might be mistaken for it; but Colonel SYKES has shot them male and female, in several places in Dukhun, full-grown birds.

Genus *Prinia*, Horsf.

78. PRINIA SOCIALIS. *Prin. capite dorsoque intensè cinereis; remigibus rectricibusque rufo-brunneis, his prope apices fusco-fascialis; subtùs rufescenti-alba, abdominis lateribus saturatioribus.*
Rostrum nigrum. *Pedes* flavi. *Irides* pallide aurantiacæ. Longitudo *corporis* 5.2, *caudæ* 2.2.
Sexes alike in size and plumage. This species constructs the same ingenious nest, and has the same habits, same note *(looee looee)*, and feeds in the same manner, as the *Ortholomus Bennettii*.

79. PRINIA INORNATA. *Prin. suprà pallidè cinereo-brunnea, strigâ superciliari corporeque subtùs albescentibus, abdominis lateribus crissoque rufescentibus; caudâ obsoletè fasciatâ.*
Irides rufo-brunneæ. *Rostrum* brunneum; *mandibulâ* inferiori ad basin flavâ. Longitudo *corporis* 4.7 unc., *caudæ* 2.7.
Sexes do not differ in size or plumage. Habits of *Prin. socialis*. Both the above species are remarkable for a struggling flight, as if they experienced difficulty in making their way.

Genus *Orthotomus*, Horsf. *Tailor Bird.*

80. ORTHOTOMUS BENNETTII. *Orth. olivaceo-viridis; subtùs albidus; capite suprà ferrugineo; caudâ elongatâ obsoletè fasciatâ.*
Irides flavæ. Longitudo *corporis* 6 unc., *caudæ* 2.7.
Two central tail-feathers elongated beyond the rest for one inch, and two-tenths of an inch wide only. Sexes alike. This bird is very remarkable for the ingenuity shown in constructing its nest, by sewing the leaves of trees together, with cotton thread and fibres. Colonel SYKES has seen nests in which the thread used was literally knotted at the end. This species very closely resembles Dr. HORSEFIELD's *Orth. Sepium*, but on a comparison of the birds, they were found to have specific differences.

81. ORTHOTOMUS LINGOO. *Orth. olivaceo-brunneus, subtùs sordidè albus.*
Longitudo *corporis* 5.6 unc., *caudæ* 2.1.

This species differs from the type of *Orthotomus* in the short tail, but has the characters of the genus sufficiently marked to be included in it. Sexes exactly alike in plumage. Principal food, black ants.

Genus *Budytes*, Cuv.

82. *Budytes citreola*. *Motacilla citreola*, Lath. This is the variety A. of *Mot. citreola* of Dr. LATHAM, vol. 6. p. 330.
Length 6.7 inches : tail 2.8.

This bird so closely resembles the European species, that Colonel SYKES has not ventured to separate it. It has the habits of a *Motacilla*, but its long hind claw sufficiently distinguishes it, and M. CUVIER has facilitated research in forming a genus for such *Wagtails* as have this claw.

83. BUDYTES MELANOCEPHALA, *Bud. olivaceo-viridis ; corpore subtùs nitidè flavo ; capite, nuchâ, rectricibusque nigris, herum duabus lateralibus albo marginatis ; alis fuscis, plumis olivaceo-flavo notatis.*
Irides intensè rufo-brunneæ. Longitudo *corporis* 6.8 unc., *caudæ* 3.

These are solitary birds, and are rarely found, excepting in the beds of rivers. In seven specimens four birds only were examined, and they happened to be males ; so that Colonel SYKES is uncertain with respect to the female.

84. BUDYTES BEEMA. *Bud. olivaceo-viridis, subtùs flavus ; capite suprà griseo ; strigâ superciliari albâ ; alis fuscis plumis flavescenti marginatis ; caudâ atrâ, rectricibus duabus lateralibus albis.*
Irides flavo-brunneæ. Statura præcedentis.

This bird very closely resembles *Budytes flava* of Europe, but differs in the shade of the upper plumage, in the hind claw being two-tenths of an inch longer, and in the base of the lower mandible being whitish. This is a solitary bird in beds of rivers : female not known.

Genus *Motacilla*, Auct.

85. *Motacilla variegata*, Steph., vol. 13, p. 234. *Pied Wagtail*, Lath., vol. 6, p. 320, pl. 114. *Mot. picata*, Frankl.

86. MOTACILLA DUKHUNENSIS. *Mot. dorso scapularibusque pallescenti-griseis, caudæ tectricibus ad apicem nigrescentibus ; capitè suprâ, nuchâ, gutture, pectore, rectricibusque mediis atris ; frontis fasciâ latâ, corpore subtùs, plumarum marginibus, alarum remigibus primariis exceptis, rectricibusque duabus lateralibus albis ; remigibus fuscis.*
Irides intense rufo-brunneæ. Statura *Mot. albæ*.

Sexes do not differ in size or plumage ; but young birds have the black less pronounced. This is the most common and abundant *Wagtail* in the Dukhun, frequenting not only the beds of rivers, but the plains ; and Colonel SYKES has seen it in his own garden frequently. It very closely resembles the *Mot. alba*, of Europe, but differs in being of a light slate or cinereous instead of a blackish cinereous, and in the wing-coverts and secondaries being edged with broader white. It is almost identical with the *Mot. alba* of the Northern Expedition.

Genus *Megalurus*, Horsf.

87. MEGALURUS ? RUFICEPS. *Meg. olivaceo-brunneus, subtùs albescens, pectore brunneo striato ; capite genisque brunnescentirufis, strigâ superciliari rufescente ; capitis dorsique plumarum rhachibus pallidioribus ; rostro pedibusque luteis.*
Longitudo *corporis* 7.5 *unc.*, *caudæ* 2.2.

Wings short : tail equal, narrow. Female unknown. Black ants only found in the stomach. This bird has the air of the *Anthus Richardi* figured in the *Planches coloriées*, 101. Frequents the plains only, like a *Lark*.

Genus *Anthus* Bechst. *Pipit*.

88. ANTHUS AGILIS. *Anth. olivaceo-brunneus ; subtùs rufescenti-albescens, fusco-brunneo striatus ; remigibus flavo-olivaceo marginatis ; ungue postico subelongato, subcurvato.*
Irides fusco-sanguineæ. Longitudo *corporis* 6.8 unc., *caudæ* 2.5.

Found on open stony lands : female unknown. Closely resembles the *Titlark* of Europe. Its chief difference is in the hind toe.

Genus *Saxicola*. Bechst. *Wheatear*.

89. *Saxicola rubicola*, Temm. *Stone Chat*.
Irides intense brown. These birds were met with only in low scattered bushes. Caterpillars, flies and ants found in the stomach.

90. SAXICOLA BICOLOR. *Sax. atra ; fasciâ alarum, uropygio, abdomine medio, crissoque albis.*
Rostrum pedesque nigri. *Irides* fuscæ. Longitudo *corporis* 5.8 unc., *caudæ* 2.4.

Female unknown. Three males were examined. Black ants, caterpillars and beetles were found in the stomach. Habits of the preceding.

91. SAXICOLA RUBECULOIDES. *Sax. cinereo-brunnea, subtùs alba ; gulâ thoraceque rufis ; rectricibus mediis nigrescentibus, cæteris ad basin albis.*
Irides intensè brunneæ. Longitudo *corporis* 4.7 unc., *caudæ* 2.

92. SAXICOLA ERYTHROPYGIA. *Sax. fusco-brunnea ; subtùs rufo-brunnea, abdomine fusco vix striato ; uropygio rufo ; crisso rufo tincto.*
Statura *Sax. bicoloris*. Male unknown.

Genus *Phœnicura*, Jard. & Selb.

93. *Phœnicura atrata*, Jard. & Selb. *Indian Redstart*, Iid.
This bird is of the size of the *Redstart* of Europe, and has the same habits. It has a very peculiar manner of vibrating its tail when seated on a bough, as if it had an ague fit. A pair of these birds built their nest in an outhouse constantly frequented by Colonel SYKES's servants, and within reach of the hand. They had no alarms.

94. *Phœnicura Suecica*. *Motacilla Suecica*, Linn.
Not differing from the European bird. *Irides* deep brown. Length 5.9 inches ; tail 2.

Fam. *Pipridæ*, Vigors.

Genus *Parus*, Linn. *Titmouse*.

95. *Parus atriceps*, Horsf. *Mésange Cap-nègre*, Temm., Pl. Col 287. f. 2.

96. *Parus xanthogenys*. Vigors, Proceedings Zool. Soc. I. p. 23. Figured in GOULD's 'Century of Himalayan Birds.'
Irides sienna brown. Tongue divided into four short *laciniæ* at the tip. Wasps, bugs, grass seeds, and the fruit of the *Cactus Opuntia* were found in the stomachs of both species.

Tribus CONIROSTRES, *Cuv.*

Fam. *Fringillidæ*, Vigors.—Genus *Alauda*, Auct.

97. *Alauda Gulgula*, Frankl.
This is the common *Lark* of the Dukhun, with the habits and notes of the *Skylark* of Europe. When confined in a cage and shrouded from the light, it learns to imitate the notes of other birds, and even quadrupeds. The male is crested. It is called *Chundoola* in Dukhun. *Irides* sepia brown. Length 6.7 inches ; tail 2.3 Food, grasshoppers.

98. ALAUDA DEVA. *Al. rufescenti-brunnea brunneo intensiori notata ; corpore subtùs striâque superciliari rufescenti-albis, pectore brunneo striato ; capite cristato, brunneo striato ; rectricibus brunneis rufo marginatis.*
Statura minor quàm præcedentis.

99. ALAUDA DUKHUNENSIS. *Al. corpore suprà griseo-brunneo, plumis in medio fusco-brunneo notatis ; subtùs albescens, pectore striâque superciliari rufescentibus ; rectricibus fusco-brunneis duabus lateralibus albo marginatis.*
Irides intensè brunneæ. Longitudo *corporis* 6.3 unc., *caudæ* 2.
Grass seeds only found in the stomach. Frequents stony plains.

Genus *Mirafra*, Horsf.

100. *Mirafra phœnicura*, Frankl.
This bird is characterized by the lightness, shortness, abruptness, and sudden ascents and descents of its flight. *Irides*, yellow-brown. Granivorous.

Genus *Emberiza*, Auct. *Bunting*.

101. *Emberiza melanocephala*, Scop.
This native of Corfu is common to Western India. It appears in considerable flocks at the ripening of the bread grain *Jowaree (Andropogon Sorghum)* in December. *Irides*, intense brown. Length, 7.3 inches : tail, 3 inches. Granivorous. Allied to *Emb. luteola*, Mus. Carls. vol. iv., t. 93.

102. *Emberiza hortulana*, Linn. *Red-brown Bunting*.
This, although not absolutely identical, is so closely allied to the European bird, that Colonel SYKES cannot separate it. *Irides*, intense brown. Length, 7.1 inches ; tail 3 inches. Grass seeds only found in the stomach. Bird, solitary.

103. *Emberiza cristata*, Vigors, Proceed. Zool. Soc. I. p. 35.
Length 6¼ inches : tail 2.7 inches. Rare in Dukhun, and found only on rocky and bushy mountains. Female of a uniform sooty brown. Grass seeds only found in the stomach. Native of China and Nepaul as well as Dukhun.

104. EMBERIZA SUBCRISTATA. *Emb. suprâ intensè brunnea, plumis brunneo pallidiori marginatis ; subtùs pallidè brunnea, fusco striata ; alarum plumarum rectricumque lateralium marginibus, rectricibusque duabus mediis castaneis ; capite subcristato. Irides* intensè brunneæ. *Rostrum* rufo-brunneum. Longitudo *corporis* 6.6 unc., *caudæ* 2.5.
Sexes alike in size and plumage. Birds rare and solitary, and found only in the open spaces on high mountains. This bird is pronounced in Europe to be the

female of *Emb. cristata;* but setting aside the fact of both sexes of each bird being in the present collection, their localities are different, and they were never seen together by Colonel Sykes.

Genus *Linaria*, Bechst. *Linnet.*

105. *Linaria Amandava.* *Fringilla Amandava*, Linn.
These beautiful little birds, so common in Goojrat, are rare in Dukhun.

Genus *Ploceus*, Cuv. *Weaver Bird.*

106. *Ploceus Philippensis*, Cuv. *Philippine Grosbeak*, Lath.
The *Weaver Bird* is very common in Dukhun, and there are few wells overhung by a tree where their nests are not seen pendent. They live in small communities, and are very noisy in their labours. They associate so readily with the *common Sparrow* that at the season of the falling of the grass seeds Colonel Sykes, in firing into a flock of *Sparrows* on the grass plats in his own grounds, killed as many *Weaver Birds* as *Sparrows.* Fruit of the *Ficus Indica* and grass seeds have been found in the stomach. *Irides*, intense brown.

107. *Ploceus flavicollis.* *Fringilla flavicollis*, Frankl.
This bird has so nearly the bill, tongue, *irides*, size and aspect of *Ploc. Philippensis*, that Colonel Sykes has considered it a *Ploceus.* Grass seeds and a few grains of rice found in the stomach. Very rare in Dukhun.

Genus *Fringilla*, Auct. *Finch.*

108. *Fringilla crucigera*, Temm., Pl. Col. 269. fig. 1. *Duree Finch*, Lath.
This minute bird has the strange habit of squatting on the high roads and almost allowing itself to be ridden over ere it rises. Smaller than a *Sparrow.* *Irides*, red brown. Coleopterous insects, maggots, and seeds of *Panicum spicatum* found in the stomachs of many specimens. This bird has the straight hind claw of a *Lark*, and should therefore neither be classed as a *Fringilla*, agreeably to M. Temminck, nor as a *Passer*, agreeably to Brisson. Its habits also separate it from both these genera. M. Temminck in his Plate has placed it on a twig, but it never perches.

Genus Lonchura.

Rostrum forte, breve, latum, altitudine ad basin longitudinem æquans; *mandibulis* integris, superiori in frontem angulariter extendente, cumque eo circuli arcum formante.

Alæ mediocres, subacuminatæ; *remigibus*, 1mâ brevissimâ subspuriâ, 2dâ 3tiâ 4tâque ferè æqualibus longissimis.

Cauda gradata, lanceolata; *rectricibus* mediis cæteras paullò longitudine superantibus.

Pedes mediocres, subgraciles.

The peculiar spear-head form of the tail, and the ridge of the upper mandible and the forehead, forming a segment of the same circle, together with the habits of the following species, afford sufficient characteristics to justify their separation from the genus *Fringilla* of M. Temminck. The *Gros-bec longicone* of the Pl. Col. 96. (*Emb. quadricolor*, Lath.) belongs to the same group.

109. *Lonchura nisoria.* *Fringilla nisoria*, Temm. *Gros-bec épervin*, Pl. Col. 500. Fig. 2.
Found only in the Ghauts. Grass seeds in the stomach. Length 5.4 inches: tail 1.9 to 2 inches. Sexes alike.

110. Lonchura Cheet. *Lonch. pallidè cinnamomeo-brunnea; corpore subtùs uropygioque albis; remigibus rectricibusque intensè brunneis.*
Fœm. *coloribus minùs intensis.*
Irides, intensè rufo-brunneæ. Longitudo *corporis* 5.4 unc., *caudæ* 2.
Tail lanceolate; central feathers longer than the rest, and ending in a point. Sexes alike. These birds live in small families. Colonel Sykes has frequently found them in possession of the deserted nests of the *Ploceus Philippensis;* but their own nest is a hollow ball of grass. Ten white eggs, not much larger than peas, were found in a nest. The cry of the bird is *cheet, cheet, cheet*, uttered simultaneously by flocks in flight.

111. *Lonchura leuconota.* *Fringilla leuconota*, Temm. *Gros-bec leuconote.* Pl. Col. 500. Fig. 1.
Found only in the Ghauts. Length 4.8 inches, inclusive of tail 1.8 inch. Sexes alike. Grass seeds only found in the stomach.

Genus *Passer*, Auct.

112. *Passer domesticus*, Briss. *Fringilla domestica*, Linn.
On submitting the *Indian Sparrow*, male and female, to a rigid comparison with *Sparrows* shot in the Regent's Park, they were found to be absolutely identical.

Fam. *Sturnidæ*, Vigors.—Genus *Pastor*, Temm.

113. *Pastor tristis*, Temm. *Gracula tristis*, Lath.

The *irides* are red brown, and remarkable for being studded on the external margin with regularly nranged yellowish-white specks. Sexes alike : omnivorous : quarrelsome, noisy. Length 11.9 inches, inclusive of tail of 3.5.

114. PASTOR MAHRATTENSIS *Past. suprà griseo-niger, remigibus caudâque saturatioribus ; capite genisque atris ; corpore subtùs subrufescenti-griseo ; crisso pallidiori, plumis albo marginatis. Rostrum pedesque* flavi. *Irides*, pallidè griseæ. Longitudo *corporis* 9.6 unc. *caudæ* 2.9.

Sexes alike. Found only in the Ghauts. Stony fruit in the stomachs of three birds. Resembles *Past. tristis*, but is a size less, possesses no crest, nnd has gray *irides*.

115. *Pastor roseus*, Temm. *Turdus roseus*, Linn.

Irides, intense red brown. Tongue bifid nnd fringed : not quite so much so ns *Hypsipetes Ganeesa*. These birds darken the air by their numbers at the period of the ripening of the bread grains, *Andropogon Sorghum*, and *Panicum spicatum*, in Dukhun, in December. Colonel SYKES has shot forty or fifty at a shot. They prove n calamity to the husbandman, as they are as destructive as locusts, and not much less numerous.

116. *Pastor Pagodarum*, Temm. *Turdus Pagodarum*, Gmel. *Gracula Pagodarum*, Shaw, vol. 7. p. 471. *Le Martin Brame*, Le Vail., Ois. d' Afr. pl. 95. tom. 2.

Irides, greenish white. Length 8.5 inches, inclusive of tail of 2.5 to 3 inches. Sexes alike. These birds are great frequenters of the *Ficus Indica*, *Ficus religiosa*, and *Cactus Opuntia*, for their fruit. Insects also are found in the stomach. Birds lively and elegant in flight.

Fam. *Corvidæ*, Leach.—Genus *Corvus*, Auct.

117. CORVUS CULMINATUS. *Corv. suprà splendenti-ater ; subtùs fuliginoso-ater ; rostri culmine elevato.*

Longitudo *corporis* 14 unc., *caudæ* 7.

Smaller than the European *Crow*. These birds are remarkable for their audacity. Bill with a considerable *culmen*.

118. *Corvus splendens*. Vieill. *Common Crow* of India.

This is no doubt Vieillot's *splendid Crow*, but in the thousands Colonel SYKES has met with he never saw the plumage ornamented with the pronounced green and blue in Vieillot's plate. Has the noisy, impudent, and troublesome habits of the English *Crow*. Length 18 inches, inclusive of tail of 6 inches. A wounded *Crow* was put into the cage with a *Vireerra Indica*, in the expectation that the latter would make a meal of it. The *Crow* however stood so vigorously on the defensive, that a treaty of peace ensued, and they lived amicably together for several weeks, the *Crow* partaking of the food of the *Civet* until it died from its wound.

Genus *Coracias*, Linn. *Roller*.

119. *Coracias Indica*, Linn. *Coracias Bengalensis*, Steph. *Blue Jay from the East Indies*, Edw. pl. 326.

Very common in Dukhun. Called *Tas*, from its note, by the Mahrattas. Sexes do not differ in size or plumage. *Irides* intense red brown. A grasshopper 2.5 inches long was found in the stomach of one bird. Length 13.3 inches, inclusive of tail of 4.7 inches.

Fam. *Buceridæ*, Leach.

Hornbills are by no means rare in Dukhun, but from accident Colonel Sykes had not a specimen to produce.

Tribus SCANSORES, *Auct.*

Fam. *Psittacidæ*, Leach.—Genus *Palæornis*, Vigors.

120. *Palæornis torquatus*, Vigors.

Appear in considerable flocks in Dukhun, and are very destructive to the crops, particularly to the *Carthamus Persicus*. Fond also of the fruit of the *Melia Azadirachta*. The female differs from the male only in wanting the collar, and has in consequence been considered to belong to a different species. The Mahrattas call the bird *Rayoo* and *Keeruh*. Length 17½ inches, inclusive of tail of 9½ inches.

121. PALÆORNIS MELANORHYNCHUS. *Pal. viridis, corpore subtus, notâ circumoculari, dorsoque imo pallidioribus ; capite, collo in fronte nucháque, columbino-canis ; rostro, torqueque collari latâ nigris ; fronte, remigibus, rectricibusque mediis cyaneis, illo pallidiori ; rectricibus subtùs, apicibusque suprà flavis.*

Irides, albæ, subflavo-marginatæ. Longitudo *corporis* 14.6 unc., *caudæ* 7.6.

Found only in the Ghauts. Sexes alike. This bird has the aspect of *Pal. columboides*, but differs in the black bill, broad black collar, pale green yellow beneath instead of dove colour, and in the want of the metallic green narrow collar and bluish rump.

Fam. *Picidæ*, Leach.—Genus *Bucco*, Linn. *Barbet*.

122. *Bucco Philippensis*. Gmel. *Burbu des Philippines*, Buff.

This well known bird is called *Tambut*, or the Coppersmith, by the Mahrattas. It sits on the loftiest and extreme twigs of trees, uttering the syllables *took took*,

took, deliberately, and nodding its head at each *took*, the sound and the motion originating the idea of a coppersmith at work hammering. *Irides*, lake colour. Length 6½ inches, inclusive of tail 1½ inch. Fruit and insects found in the stomach.

123. *Bucco caniceps*, Frankl.

Scarcely distinguishable from *Bucco corvinus* and *Bucco Javanicus*. Found only in the dense woods of the Ghauts. Its note is quite startling, and makes the hills echo. *Irides*, red deep brown. Length 8.7 inches, inclusive of tail of 2.7 inches: the bird is consequently smaller than Major FRANKLIN's. Stony fruit only found in the stomach.

Genus *Picus*, Linn. *Woodpecker.*

124. *Picus Mahrattensis*, Lath. *Mahratta Woodpecker*, Id.

Irides rich lake. Length 7.4 inches, inclusive of tail of 2.4 inches. Although this is called the *Mahratta Woodpecker*, Colonel SYKES met with three birds only in Dukhun during six years.

Fam. *Certhiadæ*, Leach.—Genus *Upupa*, Linn. *Hoopoe.*

125. *Upupa minor*, Shaw. *La Huppe d' Afrique*, La Vaill.

Irides, almost black. Length 12 to 12½ inches, inclusive of tail from 4.3 to 4.5 inches. Feeds on the ground, and does not hop.

Fam. *Cuculidæ*, Leach.—Genus *Leptosomus*, Vieill.

126. *Leptosomus Afer. Cuculus Afer*, Gmel. *Edolian Cuckoo*, Shaw. *Cuculus Edolius*, Cuv. *Cuc. surratus*, Shaw ?

Irides, reddish deep brown. Length 13.4 inches, inclusive of tail of 6.6 inches. Rare in Dukhun.

Genus *Eudynamys*, Vigors & Horsf.

127. *Eudynamys orientalis. Cuculus orientalis*, Linn. Female *Cuc. Mindanensis.*

Called *Koel or Koeel* by the Mahrattas. A well known and noisy bird, with singularly loud notes, not at all like those of a *Cuckoo*. *Irides*, rich lake. Length 17 inches, inclusive of tail of 7 inches. These birds are frugivorous. In the stomachs of many the fruits of the *Bergera Kœnigi* and *Uvaria undulata* only were found. The difference in the plumage of the sexes is very remarkable. The female is the larger bird. The tongue of this bird is exactly that of the *Cuc. canorus.*

Genus *Cuculus*, Auct.

128. *Cuculus canorus*, Linn. *Common Cuckoo*, Lath.

Irides, yellow. Length 14.5 inches, inclusive of tail of 6.5 inches. Rare in Dukhun.

129. *Cuculus fugax*, Horsf. *Bychan Cuckoo*, Lath.

Irides, bright yellow. Length 13.8 inches, inclusive of tail of 6 inches. Tongue as in 127. This bird has so much the aspect of a *Hawk* that Colonel SYKES passed it for one, until its note *koeel, koeel*, exactly resembling that of *Eudynamys orientalis*, recalled him to the tree on which it was seated, and he shot the bird.

Genus *Centropus*, Ill. *Coucal.*

130. *Centropus Philippensis*, Cuv. *Coucou des Philippines*, Buff. *Chestnut-winged Coucal*, Lath. *Malabar Pheusant* of Europeans.

Irides, rich lake. Length 19½ inches, inclusive of tail of 11½ inches. This is a very useful bird, as Colonel SYKES found a snake eight inches long, centipedes, noxious insects, and lizards in the stomach. In the stomach and *œsophagus* of one bird a lizard thirteen inches long was found.

Tribus TENUIROSTRES, *Cuv.*

Fam. *Meliphagidæ*, Vigors.—Genus *Chloropsis*, Jard. & Selb.

131. *Chloropsis aurifrons*, Jard. & Selby ?

Fam. *Cinnyridæ*, Vigors.—Genus *Cinnyris*, Cuv. *Sun-bird.*

132. *Cinnyris lepida. Certhia lepida*, Sparrm. *Nectarinia lepida*, Temm.

Irides, red brown. Length 4.8 inches, inclusive of tail of 1.5 inch. Female ashy brown above; light yellow below. Common in Dukhun. Feed on small insects; also suck honey.

133. *Cinnyris currucaria. Certhia currucaria*, Linn. *Grimpereau gris des Philippines*, Pl. Enl. 576. f. 2.

This has been considered a young bird; but Colonel SYKES can venture to affirm from a long observation of its habits in his garden at Poona, that it is a species. *Irides*, bright lake. Length 4.9 inches, inclusive of tail of 1.5 inch. A spider, a *Cicada*, and minute Coleopterous insects were found in the stomach of many birds of this species. They also hover before flowers, and suck the honey while on the wing, like the *Cinn. lepida.*

134. CINNYRIS VIGORSII. *Cinn. collo suprâ, nuchâ, ptilis, scapularibusque intensè sanguineis, collo infrà pectoreque coccineosanguineis; strigâ nutrinque mental subrictu ad pectus extendente muculâque auriculari splendidè violaceis; capite suprà,*

caudæ tectricibus, rectricibus mediis, lateraliumque, externo excepto, pogonis externis metallicè viridibus; alis, rectricibus lateralibus, dorsi inferiori lateribus, fasciâque subpectorali fuscis; abdomine griseo; dorso imo sulphureo.

Irides, intensè brunneæ. Longitudo *corporis* 5½ unc., *caudæ* 2 3.

Larvæ of flies, a spider, ants, and minute insects found in the stomach. Inhabits only the lofty trees of the dense woods of the Ghauts.—" I will here beg leave to speak in the first person. I have dedicated this magnificent bird to a gentleman whose enlarged views of natural affinities in zoology have contributed essentially to enhance the value of the science, and to facilitate the labours of every zoologist. The dedication is also influenced by a desire to testify my sense of the many kind attentions of Mr. VIGORS."—W. H. S.

135. CINNYRIS MINIMA. *Cinn. capite nuchâque olivaceo-viridibus: pectoris notis, dorso, scapularibus, uropygioque intensè sanguineis, hoc violaceo splendenti; subtus pallide flavâ; alis caudâque fusco-brunneis.*

Fœm. *olivascenti-brunnea, uropygio ruto.*

Irides, rufo-brunneæ. Longitudo *corporis* 3.3 unc., *caudæ* 1.2. Met with only in the dense woods of the Ghauts. White ants and *larvæ* of flies were found in the stomach. One bird was seen sucking honey. Female of a uniform brown, with a patch of brick-red on the rump and upper tail-coverts, and the yellow below fainter than in the male. Colonel SYKES believes this to be the smallest of the *Sun-birds*.

136. *Cinnyris Mahrattensis. Certhia Mahrattensis*, Shaw. *Cinnyris orientalis*. Frankl.

Dr. Latham does not mention the crimson joined to the yellow spot under the wing. These birds suck flowers while hovering on the wing; they eat minute insects also. Female not met with. Length 4.9 inches, inclusive of tail or 1.5 inch.

137. CINNYRIS CONCOLOR. *Cinn. viridi-olivacea, alis caudâque saturatioribus, corpore subtùs pallidiori.*

Irides, intensè rufo-brunneæ. Longitudo *corporis* 4 unc., *caudæ* 1.

Insects with long *antennæ* were found in the stomach. As four specimens obtained by Colonel SYKES were all females, and as they were met with in the same locality as *Cinn. Vigorsii*, *Cinn. concolor* may be the female of that splendid species; but the difference in the size, form, and aspect of the bird, independently of colour, is opposed to this: they were never seen together. The bird has the outline of *Cinn. Mahrattensis*. The specific appellation of *concolor* is given provisionally.

Colonel SYKES, in concluding his notice of the birds of the two first Orders, observed, that in the majority of instances his knowledge was derived from an observation of many specimens of the same species in the living state. For the most part also he had obtained both sexes, and was very rarely confined to a single specimen.

Two new species of Indian Mouse.

On June 26, 1832, Colonel SYKES presented two specimens of *mus* preserved in spirits, of which the following is the description printed in the Zool. Journal.

1. MUS OLERACEUS. The upper surface is thickly clothed with rather long smooth silky hairs of a bright pale chestnut colour; on the under surface and the inside of the limbs the quality of the hairs is the same, but their colour is nearly white with a yellowish tinge. This latter colour extends up the cheeks, round the mouth and the under surface of the muzzle, and over the upper surface of the feet; the hairs on the latter, on the muzzle, and on the long scaly tail, being very short. The ears are rather large, rounded above, and very nearly naked. The muzzle is rather short and obtuse, and the eyes are placed at an intermediate distance between its end and the base of the ears. The moustaches are numerous and long, some of them being black, and others, silvery or bright chestnut.

The extreme length of the tail, as compared with that of the body, and the comparative length of the hinder *tarsus*, furnish characters sufficient to distinguish this *Indian field Mouse* from all its congeners.

2. MUS PLATYTHRIX. The head is rather flat and the muzzle slightly elongated and acute; the tail regularly ringed with scales, from between which only a few scattered hairs make their appearance. The fur of the upper surface is of a light grey at the base; but the longer hairs have a blackish shade, with an intermixture of testaceous brown, which is more obvious posteriorly and towards the lower part of the sides. The flattened spines, which are numerous, are white and transparent throughout the greater part of their length, with a dark margin and blackish acuminate tip, beneath which they exhibit, in certain lights, somewhat of a changeable gloss. The moustaches are few in number, black at the base and white at the tips, and reach beyond the ears, which are naked, rounded with a slight point, extremely open, membranaceous, and of a dusky black. The whole under surface, together with the insides of the limbs, the upper surface of the feet, and the claws, are of a yellowish or dirty white. The tail is of a uniform livid grey, but little darker above than beneath, and tapering to a very fine point.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of October, 1834.

Days of the Month.	Barometer reduced to 32° Fahr.				Thermometer in the Air.					Depression of Moist-bulb Thermometer.				Hair Hygrometer.		Rain.	Wind.			Weather.		
	At 4½ A.M.	At 10 A.M.	At 4 P.M.	At 10 P.M.	Minimum at 4½ A.M.	At 10 A.M.	Max. by Reg. Ther.	At 4 P.M.	At 10 P.M.	At 4½ A.M.	At 10 A.M.	At 4 P.M.	At 10 P.M.	At 10 A.M.	At 4 P.M.	Inches.	Morning.	Noon.	Evening.	Morning.	Noon.	Evening.
1	,684	,828	,680	,773	83,0	86,7	86,	84,4	83,3	1,9	5,0	4,5	3,1	91	96		o.	nw.	o.	clear.	cumuli.	clear.
2	,757	,830	,662	,787	81,1	86,7	88,	87,7	84,1	0,7	5,0	7,7	3,4	93	87		o.	nw.	o.	do	clear.	do
3	,815	,834	,738	,838	81,3	86,8	85,5	87,5	82,2	0,8	5.1	8,2	3,1	95	89		o.	nw.	E.	do	fine.	do
4	,821	,898	,800	,852	81,0	84,1	84,0	85,4	80,6	1,6	4,8	5,5	2,4	96	96		ne.	n.	N.E.	haze.	cloudy.	drizzle.
5	,791	,850	,750	,823	76,8	81,5	77,1	80,4	76.1	1,0	4,2	4,6	1,1	98	97	0,95	ne.	n.	N.	rain.	hard rain.	high wind.
6	,785	,820	,733	,805	76,1	80,4	77,0	80,4	75,9	0,7	3,7	3,1	1,0	98	99	1,90	NE.	N. E.	N. E.	do	do	cloudy.
7	,765	,828	,747	,782	75,4	80,4	84,6	82,1	77,2	0,6	3,2	4,4	0,5	98	98	,75	n.	N.	n.	dull.	rn. dull.	hazy.
8	,772	,812	,718	,758	75,1	81,4	93,2	84,0	78,4	0,1	4,4	6,5	1,0	97	95		o.	o.	o.	clear.	fine,	clear.
9	,688	,763	,668	,734	78,2	83,4	98,0	84,7	81,5	1,1	5,5	5,3	2,8	95	95		o.	o.	o.	do	fine. clds.	stratus.
10	,769	,780	,697	,789	79,3	84,0	100,	86,7	83,2	1,7	5,2	6,3	2,8	95	92		o.	o.	o.	hazy.	fine.	clear.
11	,765	,809	,693	,763	82,2	85,2	102,	86,3	86,1	2,2	5,0	6,7	5,0	95	93		o.	o.	o.	clear.	do	bright.
12	,669	,790	,678	,733	83,1	85,4	95,0	86,8	83,0	2,0	3,7	7,3	4,6	98	94	,05	o.	o.	n.	do	fine. rn.	cum. cirri.
13	,721	,768	,666	,808	83,0	85,7	96,0	87,4	82,1	2,3	4,6	8,6	5,7	95	87		o.	n.	s.	do	clear.	cumuli.
14	,785	,855	,788	,842	80,4	86,1	88,0	84,4	77,4	2,9	6,1	5,4	1,7	93	94		o.	ne.	n. e.	do	cum.strat.	rain.
15	,781	,855	,750	,785	78,0	81,5	80,0	82,4	78,3	1,1	3,3	3,6	0,6	99	99	2,10	ne.	se.	E.	dull	cont. rn.	hazy.
16	,711	,820	,702	,768	77,5	81,4	82,5	82,6	79,3	0,8	3,1	2,5	0,8	99	98	,40	e.	ne.	N. E.	storm.	much. rn.	do
17	,716	,800	,706	,778	77,4	81,7	83,7	82,2	77,4	0,0	2,4	2,9	0,6	99	99	1,35	o.	ne.	E.	hardram.	showery.	scud.
18	,762	,826	,730	,798	77,2	81,1	86,7	82,5	79,8	1,2	2,7	3,6	1,2	97	99		E.	e.	ne.	hazy.	do	hazy.
19	,780	,830	,709	,800	79,1	82,5	86,6	82,8	79,7	1,3	2,3	2,4	1,9	99	98		n.	e.	S.	cumuli.	do	clear.
20	,759	,764	,650	,751	79,0	82,6	101,0	85,4	80,2	1,0	3,6	5,3	2,4	98	94		o.	e.	o.	clear.	fine.	hardshower.
21	,790	,794	,603	,734	79,1	81,9	104.0	84,8	82,2	1,4	3,2	5,2	2,7	97	95	,45	o.	w.	o.	cumuli.	clear.	cum. cirrus.
22	,693	,788	,672	,746	80,0	83,2	101,	84,9	78,2	1,6	3,5	4,9	3,5	98	96		n.	ne.	n.	do	cum.strat.	storm.
23	,721	,789	,696	,754	79,5	83,1	105,	86,2	78,7	1,0	3,2	5.6	7,3	98	96	,70	n.	nw.	n.	clear.	do	hd. squall.
24	,732	,803	,744	,781	79,5	83,1	90,0	83,3	79,2	1,5	3,6	6,0	1,8	97	95	,85	n.	ne.	o.	cumuli.	showers.	haze.
25	,768	,808	,714	,727	78,8	81,2	95,7	81,9	77,2	1,7	3,3	5,0	1,1	99	93	,55	o.	ne.	n.	nimbi.	rn. clear.	cl. rain.
26	,815	,872	,822	,886	77,2	82,4	90,8	82,4	78,3	1,7	4,0	4,0	2,0	97	96	,05	ne.	o.	n.	clear.	fine.	clear.
27	,858	,950	,880	,910	78,2	82,4	90,0	80,7	76,5	2,1	4,6	4,4	1,1	97	96	,05	o.	ne.	ne.	do	rain.	do
28	,797	,954	,878	,905	75,1	79,7	84,0	81,5	76,5	1,2	3,3	3,6	0,7	99	98	2,00	ne.	ne.	n.	do	cloudy.	do
29	,884	,950	,820	,868	76,6	81,2	91,2	82,9	77,5	1,0	3,8	5,8	1,7	98	95		n.	S.	S.	do	cumuli.	do
30	,802	,986	,800	,856	76,2	81,2	86,7	82.7	80,0	0,5	4,4	5,2	2,2	97	96	,25	ne.	se.	S.	do	hvy. sqall.	storm.
31	,803	,970	,788	,844	78,2	81,0	95,2	82,1	78,7	0,5	4,0	3,8	1,5	97	98	,35	S.	SE.	S.	hazy.	cloudy.	rn. clear.
Mean,	29,766	,836	,732	,800	78, 9	82,9	90,6	83,9	79,6	1,3	4,0	5,0	2,3	96,8	95,5	13,05	calms.			unusually wet.		

The instruments are the same, and placed in the same situations as usual.

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